THE
physical therapy REVIEW

37th Annual Conference
American Physical Therapy Association
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Graduate Study—A Key to Professional Development: Research and Writing— HELLEBRANDT

Does Heat Cause Relaxation?— WEIDENBACKER and SMITH

The Effects of Therapeutic Agents on Muscular Strength and Endurance— WALTERS, GARRISON, DUNCAN, HOPKINS, and SNYDER

State Examinations for Physical Therapists— NELSON

Report of the 1959 Research Survey— HARMONY and WILLIAMS

Communication with Non-English Speaking Patients:
II. Danish, Norwegian, Swedish— THORNSEN, HANSTEEN, HAMILTON and ELLINGSEN

UNICEF Rehabilitation Program in Ten Countries

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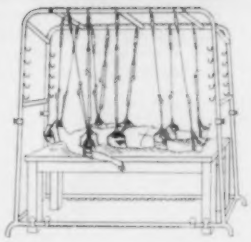

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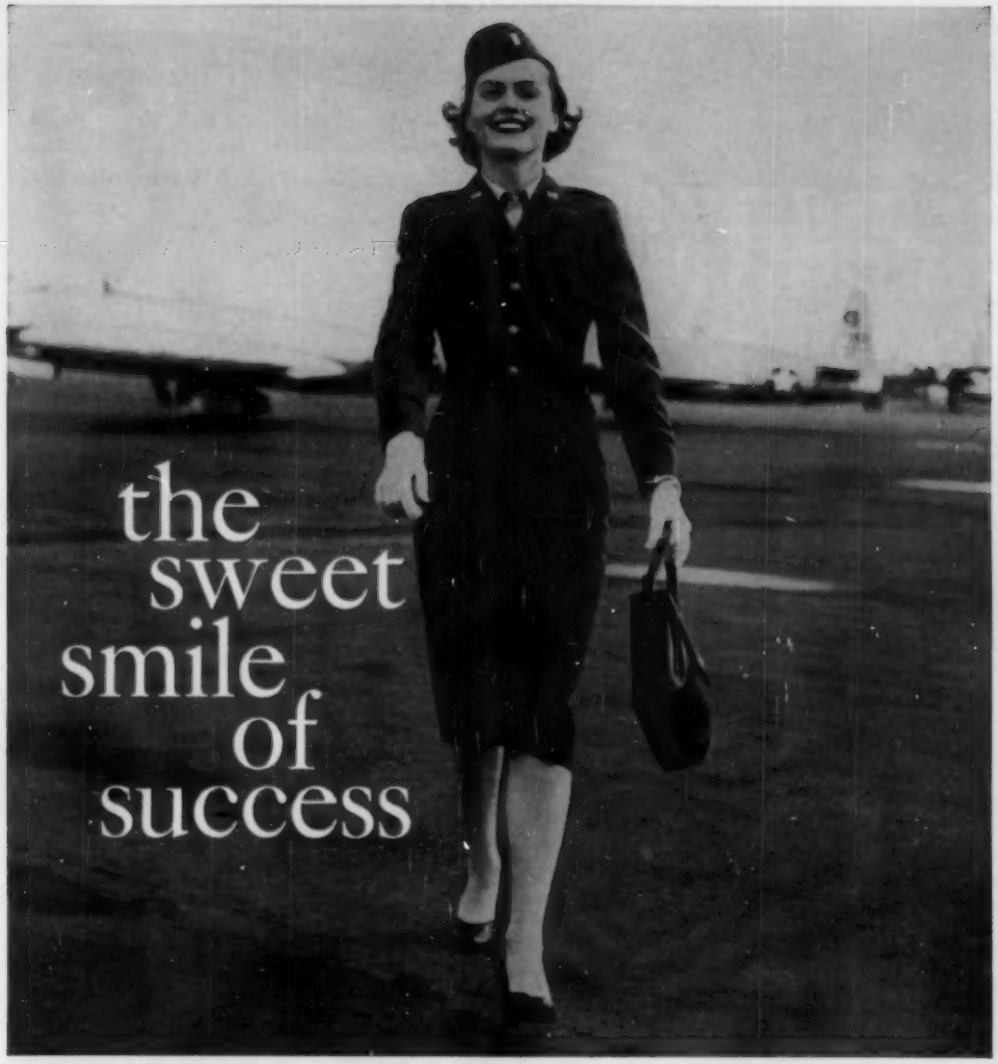

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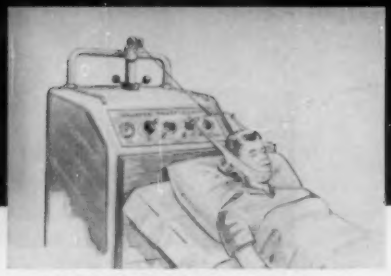

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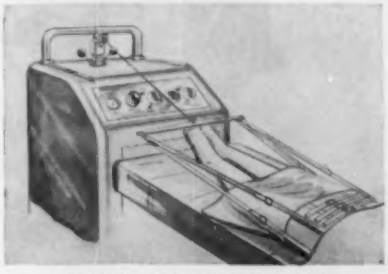

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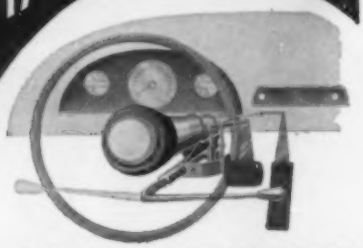

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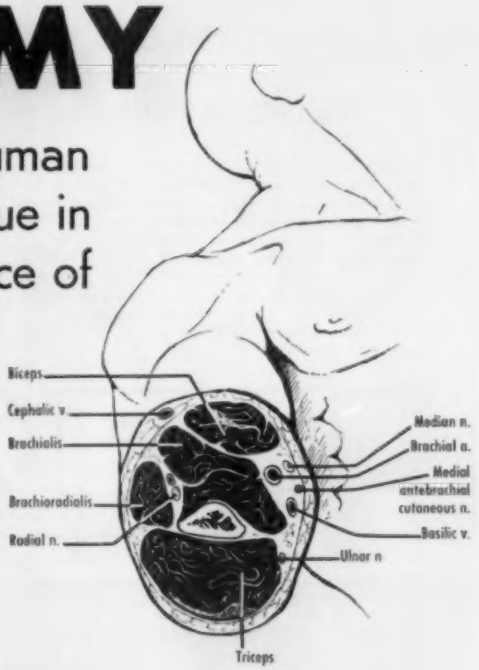

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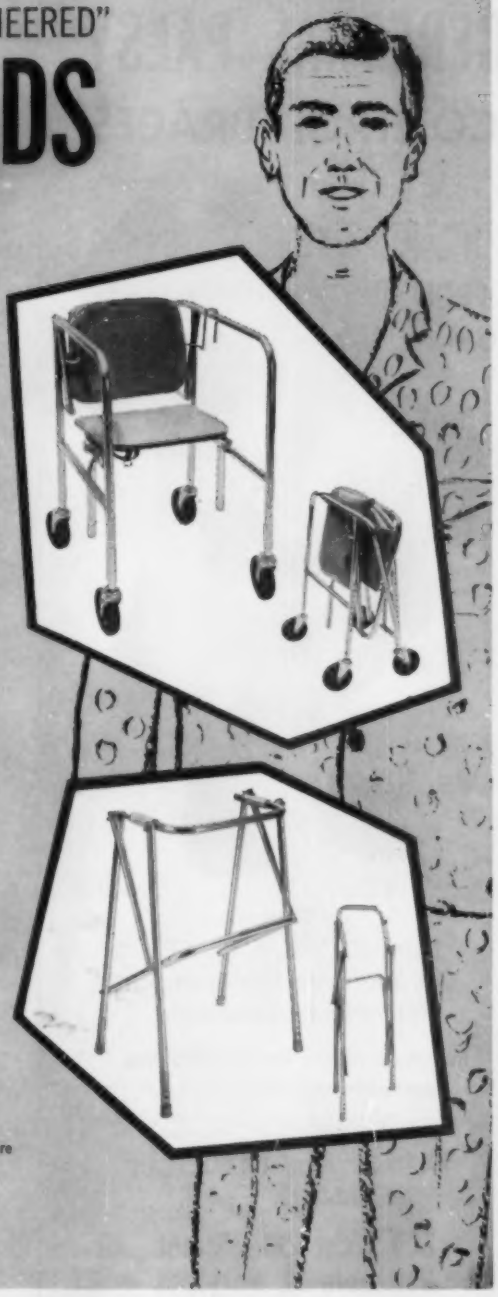

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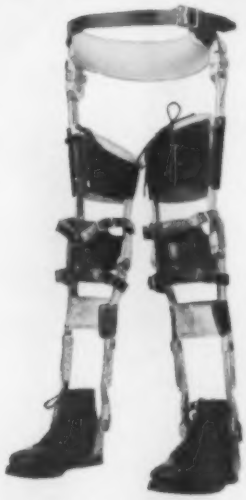

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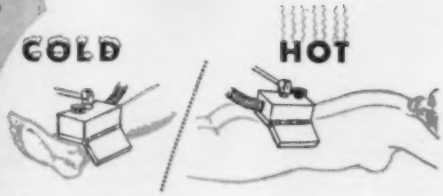

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Effects of Abnormal Brain Development on Function. Paul E. Polani, Cerebral Palsy Bull. 7: 27-31, Autumn 1959

Hearing Problems in Athetoid Cerebral Palsy. Annette Zaner, A.M.A. Arch. Otolar., 70: 776-778, December 1959

Nature of the Functional Disorder in Hypertonus. Geoffrey Rushworth, Cerebral Palsy Bull., 7: 3-7, Autumn 1959

The Habilitation of Adult "Spastics." C. D. S. Agassiz, Cerebral Palsy Bull., 7: 42-48, Autumn 1959

CARDIAC PATIENT

A Modified Harvard Step Test for Women. A. W. Sloan, J. Appl. Physiol., 14: 985-986, November 1959

Treatment of the Shoulder-Hand Syndrome. Irwin S. Eskwith, Postgrad. M., 26: 800-804, December 1959

ELECTROTHERAPY

A Stimulator for Students' Use in Physiology and Pharmacological Laboratories. A. H. J. Visschedijk, Acta physiol. pharm. neerl., 8: 349-353, December 1959

Pathological Effects of Ultrasound on the Brain. E. Nelson, P. A. Lindstrom and W. Haymaker, J. Neuropath., 18: 489-508, October 1959

Relationship Between Strength and Duration of Threshold Electrical Stimulations in Stimulations of Short Durations. A. A. Vereninov, Biophysics, 4: 38-47, September 1959

FUNCTIONAL AIDS

Self-help Devices: Bathing Aids. E. W. Lowman and H. A. Rusk, Postgrad. M., 26: 879-881, December 1959

GERIATRICS

Angina Pectoris and Rehabilitation in Geriatric Patients. H. Eisfelder, B. Ficarra and L. Ames, J. Am. Geriat. Soc., 8: 62-65, January 1960

Program for the Older Disabled Worker. H. Rusalem, J. Rehabil., 25: 24, September-October 1959

MUSCLE

Anterior Tibial Syndrome. A. Grunwald and Z. Silberman, J. Am. M. Ass., 171: 2210-2213, Dec. 19, 1959

Formal Genetics of Muscular Dystrophy. N. E. Morton and C. S. Chung, Am. J. Human Genetics, 11: 360-379, December 1959

NEUROLOGY

A Restricted Form of Cerebellar Cortical Degeneration Occurring in Alcoholic Patients. M. Victor, R. D. Adams and E. L. Mancall, A. M. A. Arch. Neurol., 1: 579-688, December 1959

Intrathecal Phenol in the Treatment of Reflex Spasms and Spasticity. R. E. Kelly and P. C. Gautier-Smith, Lancet, Lond., 2: 1102-1105, Dec. 19, 1959

Intrathecal Phenol to Relieve Spasticity in Paraplegia. P. W. Nathan, Lancet, Lond., 2: 1099-1102, Dec. 19, 1959

Myasthenia Gravis: Its Diagnosis and Treatment. Kenneth R. Magee, Clin. M., 6: 2301-2310, December 1959

Myotonia of the Lower Axial Musculature Simulating Lumbar Spinal Nerve Root Lesion. A. A. Marinacci, Bull. Los Angeles Neur. Soc., 24: 166-173, September 1959

Symposium of Facial Paralysis. K. Kettel, J. Collier, D. Taverner, R. W. Gilliatt, J. A. Sullivan and B. Smith, Proc. R. Soc. M., Lond., 52: 1069-1086, December 1959

The Undertreated Parkinson Patient. Lewis J. Doshay, Clin. M., 6: 2337-2345, December 1959

NEUROPHYSIOLOGY

Activation of Spinocerebellar Neurons by Adequate Exteroceptive and Proprioceptive Stimulation. S. Yamamoto and M. Miyajima, Exper. Neurol., 1: 427-440, November 1959

Contributions to the Physiology of Spinal Shock. J. Ten Cate, J. Th. F. Boeles and P. Visser, Acta physiol. pharm. neerl., 8: 315-325, December 1959

Electrophysiological Properties of Certain Muscles of Warm-Blooded Animals as Related to their Tonicity. N. F. Skorobovichuk, Bull. Exper. Biol. & M., 47: 523-527, May 1959

The Plantar Reflex in Man, with Special Reference to Some Conditions Where the Extensor Response is Unexpectedly Absent. William Landau and Margaret H. Clare, Brain, Lond., 82: 321-355, September 1959

The Reversal of Chemical Reactions in Contracting Muscle during an Applied Stretch. A. V. Hill and J. V. Howarth, Proc. R. Soc., Ser. B, 151: 169-193, December 1959

The Stretch Reflex in Man. G. Tardieu, P. Rondot, J. C. Dalloz, J. Mensch and C. Monfraix, Cerebral Palsy Bull., 7: 14-17, Autumn 1959

ORTHOPEDICS

Common Foot Disabilities. H. O. Bruck and C. N. Lambert, Am. J. Nurs., 59: 1580-1583, November 1959

Infantile Structural Scoliosis. J. I. P. James, G. C. Lloyd-Roberts and M. F. Pilcher, J. Bone Surg., 41-B: 719-735, November 1959

Scoliosis in Twins. G. Murdoch, J. Bone Surg., 41-B: 736-737, November 1959

POLIOMYELITIS

Current Status of Live Poliovirus Vaccine. Leroy E. Burney, J. Am. M. Ass., 171: 2180-2181, Dec. 19, 1959

RESPIRATION

Obstructive Emphysema in Cigarette Smokers. A. J. Flick and R. R. Paton, A. M. A. Arch. Int. M., 104: 518-526, December 1959

The Expiratory Ventilogram. Application of Total and Maximal Expiratory Flow, as Obtained by a Bellows Apparatus for Bedside and Office Use. G. E. Horton and S. Phillips, Am. Rev. Respir. Dis., 80: 724-731, November 1959

TESTS AND MEASUREMENTS

The Recording Dynamometer in the Assessment of Motor Function. R. G. Willison, Cerebral Palsy Bull., 7: 12-13, Autumn 1959

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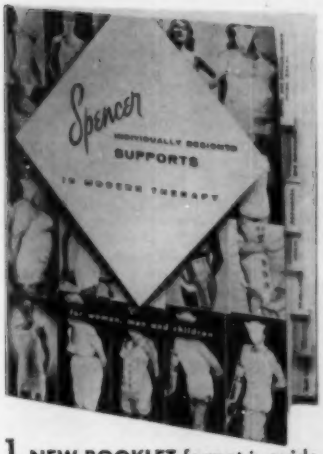

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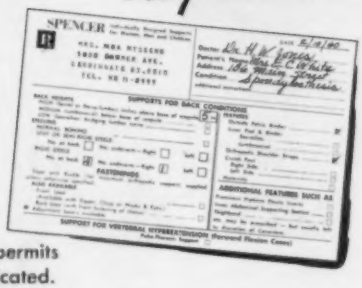

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Graduate Study— A Key to Professional Development: Research and Writing*

F. A. Hellebrandt, M.D.

The topic assigned to me for presentation before the Exploratory Session on Graduate Study presupposes an interest in the type of education in physical therapy that leads to a higher degree in the classical academic sense. This I believe is a practical ultimate goal for the physical therapist, if not an immediately feasible objective. My remarks are directed primarily, therefore, at the kind of education beyond the professional degree which places emphasis on scholarly endeavor.

The opportunity to participate in research is one of the distinguishing features of graduate study, especially that pursued on the doctoral level. The graduate student is no longer preoccupied primarily with the mastery of generally accepted knowledge. He traces the threads elucidating the development of some area of subject matter and then, having reached the limits of that known, extends the frontiers of understanding through the exercise of his own intellect. For the first time attention is focused on the unknown rather than the known. Although the advance in human knowledge made by the graduate student may seem small to the casual observer, the qualities of mind and the disciplines required to achieve this rank among the most important acquisitions of his academic experience. The exhilaration of that journey into the unknown, the critique engendered by the endless weighing and balancing of evidence, and the premium placed on accuracy of observation have an impact in the aggregate that frequently colors the whole of life which follows. Graduate study does this because it is concerned more with the development of the mind than the procurement of knowledge, and the opportunity to participate in research is one of the most effective devices known to attain this highly desirable objective.

The values of research in the higher education of physical therapists will vary from student to student and with the mental equipment and professional experience each brings to his graduate study. Participation in research is often the student's initial exposure to the challenges inherent in the active acquisition of knowledge in contrast with that obtained passively through reading or listening to lectures. The independent search for truth calls into being habits of mind which, if exercised diligently, cannot help but stimulate the kind of lifelong self education needed in a health

Professor in Medicine and Education, and Director, Motor Learning Research Laboratory, University of Wisconsin, Lathrop Hall, Madison.

* From a paper read at the Exploratory Session on Graduate Study sponsored by the American Physical Therapy Association and the Office of Vocational Rehabilitation, Oct. 18-21, 1959.

field as rapidly advancing as medical rehabilitation.

Physical therapy is a vocation widely recognized and respected for its high technical and ethical standards. It requires considerable manual training and dexterity. The rationale of its technical procedures rests upon a large body of theoretical knowledge. For this reason the physical therapist believes that his is a learned calling or a profession. Implicit in that conviction is confidence that physical therapists have the intellectual capacity to grasp and understand their own problems, the desire to seek solutions, the knowledge and skills to implement such studies as might be indicated, or the insight to enlist the services of consultant specialists.

The growth and development of all learned professions rests upon continuous, unremitting study. Each new advance in basic knowledge challenges the validity of innumerable applied concepts. As one gap in understanding closes, others are opened. The strength of a profession is measured, therefore, by the vigor with which it cultivates the independent thinking of its own members, and the extent to which it supports that thinking by systematic study and open discussion. This suggests that the professionalization of a vocation is related in a large measure to the scope and quality of its own research endeavor.

If the physical therapist elects to do graduate study in some already established academic area such as education or the basic medical sciences, he fulfills the requirements of the department with which he is affiliated. One of these, invariably, is the preparation of a dissertation based on original thinking and independent research. He discharges this most important of all graduate responsibilities under the guidance of a teacher who is himself a scholar. An exploratory session on graduate study sponsored by a professional organization is interested, presumably, in assessing its own fitness to assume a like responsibility for the advanced training of its members. One must examine, therefore, the climate of the typical physical therapy school as currently constituted.

If graduate study is to be offered in physical therapy, then research must be one of the major responsibilities of the faculty of the physical therapy school and adequate facilities for research must be provided. Nothing is more futile than to expect of the candidate for a higher degree a type of intellectual activity not practiced by the faculty to whom graduate students are assigned. Conversely, nothing is more contageously stimulating to graduate and undergraduate students alike than the privilege of pursuing their studies in a research atmosphere, where nothing is sacred by authority, and the assumptions made are subjected gradually to experimental verification. An enthusiastic, intelligently conceived, on-going research program is a potent catalyst. It affects the approach to problem solving of all who come into contact with its various ramifications. Good habits of thinking, discriminating, and judging are continually fostered. The dogmatic teaching of empirical practices is virtually impossible in such a milieu. To think and to understand take precedence over the memorization of textbook facts and technical procedures. My own personal experience with therapists in the clinic and in the school suggests that this kind of ferment in no way jeopardizes the quality of the services rendered by professional workers. Indeed, the participation of students and staff in research projects and seminars is a great augmenter of high level professional interest. Such activity or related types of intellectual effort will find their way into physical therapy schools as soon as the forming of the mind becomes as important a function of the teacher as the imparting of knowledge and indoctrination in the customs of the hierarchical hospital system.

The role of the physical therapist and its medicolegal implications imposes certain limitations on his freedom in research. The physical therapist practices a limited form of the healing art on delegated authority as the agent of the referring doctor. He treats the patient in the place and stead of the physician. He can neither diagnose disease nor prescribe treatment. To perform either of these acts requires a training and experience beyond that characteristic of the average physical therapist. However, anyone who has had much firsthand contact with physical therapy as it is actually practiced knows that experienced and well qualified workers in this field operate under wide discretionary latitude and exercise independent judgment of very high order in day-by-day clinical programing. Individual responses to the treatment prescribed must be evaluated each time a physical agent is administered. This calls for accuracy of observation and critique in assessing the significance of phenomena noted. Physical therapists do indeed practice a limited form of the healing art. This does not, however, give them the right to engage in independent research on problems constituting the practice of medicine.

The contradictions in the role played by the physical therapist have given rise to certain attitudinal conflicts inimical to the creation of a research atmosphere in the physical therapy school. Perhaps the most obvious of these is the vocational orientation of undergraduate training.

Emphasis is placed overwhelmingly on technical proficiency and skill in the attainment of the practical results purported to follow from the administration of physical agents. The physician has absolute authority in the management of his patient and the therapist is trained to function as his handmaiden.

Service to the sick has a large emotional appeal, especially to women. Many therapists are content to restrict their activities to patient care, focusing all of their attention on the alleviation of human suffering without much interest in the mechanisms whereby end results are achieved. These are the technical assistants of the referring physician, and as such they fulfill a very real and important function. Perhaps the majority of physical therapists will always belong to this category. However, experience suggests that even the most dedicated clinical therapists are responsive to research programs which bear a discernible relation to the efficacy of therapeutic procedures. They are frequently acutely perceptive observers, sensitive to changes in behavior which might escape the notice of the experimenter who does not possess the insights attainable from day-by-day experience in the field of clinical physical therapy. Such therapists do not of their own accord do much to create a research atmosphere in the clinic. They are, however, invaluable members of any clinical research team if given the supplementary training and supervision required.

The growth of the inquiring mind is nurtured by rigorous insistance on two things; *first*, on accuracy in observation, and *second*, on personal evaluation of the significance of such evidence as may be revealed. Subserviance to authoritarianism and the sanctity of tradition are poor foundations for a profession. In my opinion, it is extraordinarily important to teach the physical therapist that there are areas in which he has a right to trust his own eyes, form his own judgments, draw his own conclusions, and present them for discussion. It will require strong faculties to put such concepts into operation. The approach suggested is hardly possible without the concomitant development of research programs aimed at elucidating some of the discrepancies between the results purported to follow upon the administration of traditional practices and those demonstrated through the application of valid and reliable objective measures.

As increasing numbers of physical therapists enter graduate study it is inevitable that teaching on the undergraduate level will be less dogmatic and that stereotyped and empirical practices will gradually give way to defensible procedures. Trust must be strengthened in judgments based on firsthand knowledge. Once an appreciable number of physical therapists develop intellectually to that point, there will be a wider acceptance on the part of qualified professional workers of responsibility in the solution of their own problems without leaning so heavily on associates in the fields of medicine, the biological and the behavioral sciences.

We come finally to a consideration of the kinds of research which can be done by physical therapist researchers. I am not talking now about graduate education, but rather of weaning the therapist away from excessive dependence on others for the solution of his problems. One of the most important is educational research to clarify what needs to be known to improve the teaching of physical therapists. Psychological and sociological research is also needed. This deals with physical therapists, their aptitudes and interests, their economic status and similar problems. Research in the organization and management of service programs, frequently administered by therapists, is another field ripe for investigation, perhaps through application of the case history method of study developed so admirably at the Harvard Graduate School of Business Administration and so extensively used at the present time in the training of business executives. Research in any of these areas entails serious study, in depth, in fields outside of physical therapy.

Being myself an experimental physiologist I would stress especially the urgent need for more and better research in the scientific foundations of the practices of physical therapy. It is a constant source of wonder how a thoughtful teacher, capable of exercising critique, can teach with equanimity some of the things perpetuated in the literature of physical therapy. They are handed down from one generation to the next without anyone having taken the trouble to put them through the mill of an uncompromising reason—let alone subjecting them to sober scientific study. This, I think, is the real challenge for those who teach technical subject matter in our professional schools. Systematic investigation of the body of knowledge which forms the scientific foundation of physical therapy is long overdue. There is no obstacle to a concerted attack in this area of research by physical therapists themselves, other than the will and the determination to obtain the knowledge and scientific skills required. It is very much the business of professional physical therapists. Research of this type can never be done as effectively by cooperative colleagues in the basic sciences, no matter how sincere their

interest. It would be impossible to emphasize too strongly the value of approaching such investigations with the insights gained from firsthand day-by-day experience in the treatment of patients. These are advantages unique to the individual who administers the treatment prescribed and by virtue of that simple fact, has the opportunity of observing with his own eyes the consequences of physical therapy.

How can physical therapy research programs be instituted. The easiest way, and perhaps the method obligatory at this stage in the development of the profession, is through the medium of collaborative programs. Some types of physical therapy research cannot be done except in conjunction with a collaborator. I refer especially to clinical physical therapy. This must be done with, and is usually done only at the instigation of, a responsible physician.

Another convenient channel is participation in team research programs. Physical therapists with strong clinical leanings should choose to do their graduate study in medical centers sponsoring cross-departmental research programs which include physical medicine. Sooner or later sufficient strength may develop within the profession itself to launch effective independent research. The movement in this direction might be hastened in several ways. *First*, by workshops in various aspects of research methodology. But let me qualify this. Research is a creative endeavor that comes from the mind of the researcher. It cannot be taught. Research is something which one does, not something to be talked about. Symposia, workshops, and even courses in the technics of research are, in my estimation, without profit unless the participants have original creative minds which have already been brought to bear on the solution of some problem. The admission ticket to a workshop in research methodology should be some hypothesis already formulated and the notebook containing the pilot experiments already performed to put the supposition to a preliminary test. My contact with physical therapists has been close enough to know that these professional workers sometimes make astute observations. They are alert to the unexpected and often recognize the importance of incidental aberrant reactions. There is much informal research done by physical therapists, but the thinking about this research is often undisciplined, and the fact-gathering is too casual. A good, brief study session, limited to those who have made and recorded original observations, no matter how unsystematically, and who have already pondered their significance, might give genuinely worthwhile guidance. A *second*, and related device might be the institution of workshops in scientific writing. These too might be of value to the person battling with the intricacies of preparing a manuscript for publication. Like creative writing conferences, they would be meaningful only to the person who has already tried to formulate and discuss specific questions in the light of his own observations and who would like to submit his efforts to critical analysis. Much useful information collected by therapists in the clinic is lost because of a need for practical guidance in the simple craftskill phases of research and writing.

Research has only one purpose, and that is to add to human knowledge. To communicate that which has been learned through original study is one of the obligations of the researcher. Thus writing cannot be separated from research. It is an integral part of the research process and one of the important technics learned by all who spend any appreciable amount of time in the contemplation of bodies of evidence which enhance understanding. For many, writing is the most difficult of all the steps which comprise research. Few investigators enjoy this aspect of research, but all serious students accept the reponsibility of communicating the results of their investigative effort.

It is not at all uncommon in established fields for a worker in a given area to travel to another laboratory to learn technics important to the development of his own research. It would seem to me that if research is important to the professionalization of physical therapy, a *third* step toward expediting the independent investigations of physical therapists might be the acquisition of funds to permit selected persons to visit research centers and remain long enough to take part in the work of an established laboratory. This is one way to learn the disciplines and technics of research. They are much the same, irrespective of the particular field of interest. Scientific indoctrination of the types implied might go a long way toward strengthening the investigative experience of teachers destined to become the faculty members of graduate schools of physical therapy.

Does Heat Cause Relaxation?*

Rheta Adams Weidenbacker, M.A., and Candace Smith, B.A.

Introduction

The principle of applying heat to the body for relaxation is known to all of us. A moderately warm bath is taken at bedtime for relaxation; yet a hot bath or a cold bath is believed to be a stimulant. We have all appreciated the soothing, lazy feeling experienced while bathing in the sun. Numerous examples of the body's response to comfortable heat can be given, but it is difficult to examine the physiological and psychological mechanisms involved during this response.

The objectives of this paper are: (1) to define and discuss the terms "relaxation" and "heat," (2) to survey the current literature as to the uses of heat for relaxation purposes, and (3) to speculate regarding the mechanisms involved in this cause-effect relationship.

It is interesting to note that even though this relationship between heat and relaxation has been empirically established for many years, few experiments or studies on the subject have been published. In physical therapy the application of heat for relaxation is a principle readily accepted although we have barely gone beyond the layman's understanding and can scarcely explain what we mean when confronted with questions from interested medical personnel. Consequently, we believe that a more thorough look at the subject is needed.

Definition of Terms

Relaxation

The term "relaxation" has not been credited with a scientific definition. This is largely because there are many ways to evaluate the response of the patient and all of these are subjective. Consequently, the phrases "the subject looks relaxed" or "the subject feels relaxed" are commonly used. Since no form of quantitative evaluation of the state of relaxation has, as yet, been determined we find it difficult to describe scientifically just what relaxation really is. Jacobson[1] describes the feeling of relaxation as a lack of tension—both physical and mental. Phillips[2] uses the term "conscious inhibition" to describe what many physical therapists call "active relaxation." Since, clinically, we cannot presently measure tension in muscle at the tone level, we rely on outward signs to indicate that the muscle is more relaxed or that the musculature of an extremity as a whole reveals less tension. A subject may show relaxation by his facial expressions if it is total body relaxation we are attempting and observing, or he may exhibit more range of joint motion or less palpable tone in a muscle or muscles, as the case may be. Generally speaking, then, relaxation is a neuromuscular state of the body or a part of the body, where a lowered excitatory state is evident; there is an observable reduction in muscular tone of the part being considered.

This release in muscular tone may be observed when the patient ceases to hold a part in a contracted state. We may or may not see an increase in joint range. We may see or feel a change in firmness of a part, i.e., skin creases may have altered, or we may feel by palpation a difference in muscle tension. The patient may state that he feels less tense and this psychological release in turn produces a secondary muscular release. Still another way of observing that a patient's state of excitability has diminished is the halting or slowing of involuntary movements, for example, as in athetosis or tremor. Total relaxation is sleep.

Heat

As early as the seventeenth century, Robert Boyle proposed the idea that heat was a result of molecular activity. Heat and cold are not distinct entities but are degrees of molecular activity (temperature). Heat, as the term is used in physical therapy, means the application of thermal energy for therapeutic purposes. The effects of externally applied heat are dependent upon a number of variables. The depth of penetration is probably the most significant factor in therapeutics and it is quite obviously a function of the type of heat-producing equipment used. Dur-

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ation of exposure and the size of the area exposed are also important. The rate at which the tissue temperature is changed must also be considered. This depends on the temperature of the tissue prior to the application of the heat—was the temperature abnormally high or abnormally low due to pathology or physical state of the environment? For example, if a patient had a circulatory disease that altered the free adjustment of the arterioles, or if a patient walked to the treatment center from a distant point on a hot, humid day, heat of either deep or superficial penetration would have a different consequence when applied in either case. It is under such circumstances that rate of temperature change in the tissues might alter the physiological response enough to cause a reversal from that which is usually expected. If this change occurred at a rapid rate, i.e., from extremely low temperature to high temperature, we could produce a typical neuromuscular response of activation since this rapid change would be a stimulus. A rapid change from high to low temperature, of course, could also serve as a stimulus. Subsequently we shall refer to this phenomenon. It has been said that heat, as energy, actually cures nothing; rather it is the effect of temperature on circulation and metabolism that causes the physiological changes which relieve the symptoms.[4]

Effects of Therapeutic Heat

In order to discuss the relationship of heat with release of tension in muscle tissues, it is best to review the effects of heat on the tissues and systems of the body in general. First, it is essential to consider that there is a constant dynamic exchange of heat energy within the living body. In the body, as in a test tube, a chemical reaction is quickened by an increase, and slowed by a decrease, in temperature. The body constantly adjusts to the amount of food intake, work, and heat exchange. The thermostat, or regulator, is the hypothalamus where integration of all the central nervous system's thermal equilibrium reactions are registered and controlled. The hypothalamus consists of a number of nuclei from which fibers extend to all parts of the brain and into the spinal cord. These fibers indicate the proper signal at the proper time so as to alter the autonomic function sufficiently to keep the body's temperature in equilibrium. If there is a need to reduce heat in an area, a message will be sent to control the amount and duration of the vasodilatation. There is a direct relationship here, i.e., the more heat the body must throw off to maintain its thermal equilibrium, the larger the area and the longer the duration of vasodilatation. Consequently, there is more to the application of therapeutic heat than one tends to consider when simply applying heat from an infrared lamp or adjusting a diathermy machine.[5] The individual variations are numerous and depend on: (1) the physical state of the patient at the particular time, (2) the emotional state of the patient at the time, (3) the pathology, (4) the source of heat and the dosage used. For the purpose of this paper, we will discuss heat and its effects in general, being fully aware that there are variations in the degree of the reaction.

Fundamentally, no matter what form of heat is used, the physiological responses are basically the same. These are: (1) temperature increase, (2) increase in cellular exchanges which means an increase in general metabolism, (3) vasodilatation, and (4) effect on rate of blood flow—this is usually an increase but may be a decrease. The changes just listed, viz., (2, 3, 4) actually occur as a result of (1) the increase in temperature. In addition to these basic changes, often there are other reactions stated. Two specific ones commonly quoted are relief of pain, and relief of muscle spasm. No one is at all certain about the mechanisms of these two clinical findings although there have been many speculations. The relief of pain is often attributed to the soothing effect of the heat which is believed to cause an interruption in cyclic pain receptor discharges sufficiently to give temporary relief. In this presentation we are more immediately concerned with the relief of muscle spasm. Millard[3] speaks of this as a "tissue tension alteration." This is really quite a vague description and is apparently dependent on the judgment of the observer. There are others who speak of this today, quite commonly in European literature in relation to Bindegewebsmassage, and who mean something quite different from what we observe in terms of Millard's description. Von Wessowetz[3] is of the opinion that "heat lessens hypertonicity and produces sedation thus decreasing spasticity and releases tightness and shortening in muscles and related structures in neuromuscular disorders." Whereas, Kovacs[6] simply says, "the relief of muscle cramps by heat is well known." There is a paucity of information of an experimental nature as regards effects of heat—deep or superficial—on the activity of nerve or muscle. Just as one can correctly state that the effects of heat previously mentioned are truly a result of temperature change,[7] similarly one might say that most likely the relaxation of muscle fibers may be a result of the relief of pain or discomfort, rather than a result of the effect of heat energy

on the nerve or muscle. Fisher and Solomon,[3] however, have written that "painless spasm and other painless strong increases of tonus of skeletal muscle are also affected by heat." This brings us to the point of this paper. Does heat cause relaxation?

DISCUSSION

We have previously indicated that the effects of heat upon the central nervous system vary, depending on the numerous factors which alter the amount of energy reaching the tissue in a measured period of time. The literature in physical medicine does offer numerous comments regarding the effects of heat on the neuromuscular system, but many are quite generally stated; for example: A sudden hot, moist application stimulates the cutaneous nerve endings, eliciting a brief excitatory state. Previously we referred to the fact that a sudden application of heat can cause a neuromuscular response. No one has actually said how this may be observed in a patient. Is the tone obviously increased? Does the patient appear more tense? According to another author[8] the reverse is true; it is declared that gradually applied moderate heat is soothing to the peripheral nerves. What does this really mean? Does it mean a decrease in frequency of receptors firing, or an increase? If the heat is applied gradually, i.e., less than an increase of 0.001 degrees C./sec. and is moderate in intensity, there may be little change in the afferent inflow—judging, of course, from what is known of this reaction in animals. But, for our immediate purposes, we should consider that perhaps this release, or "soothing response," is a psychological response to the comfort and warmth. A quotation that many of us have read is "short wave diathermy definitely reduces nerve conductivity in a physiological frog-nerve-muscle preparation" (taken from Mogendovich—see references).[6] Does this refer to afferent or efferent "nerve conductivity" or both? Can we continue to use the term "nerve" so loosely? Does reduction of "nerve conductivity" alter muscle tension? If it is not stated, is one left to deduce that reduced conductivity logically leads to a release in muscle tension? Are we speaking of a single nerve preparation?

Tuttle has presented some interesting studies that were made on human beings and which are specifically related to this discussion. The relaxation phase of skeletal muscle was markedly prolonged in 20 normal humans following short wave diathermy.[9] This would indicate that the muscle was actually affected. In nine normal subjects the knee jerk was measured before and after the application of high frequency current. When heat was sufficient to cause perspiration, the knee jerk response was measurably less.[10] This leaves us with no evidence as to the site of the reaction, i.e., nerve, junction or muscle. Yet it does offer some data of a quantitative nature that was gathered from human subjects. One study indicated that possibly cellular changes in skeletal muscle of rats occurred following prolonged doses of infrared radiation.[11]

Thus, there is little substantial evidence as to just what does cause clinical evidence of relaxation following the application of heat. We must keep in mind the strong possibility that heat may be a stimulus for a psychological reaction which in turn produces the relaxation. Certainly the general body reaction of relaxation that one gets while lying in the sun is a response brought about by some psychological stimuli. As the psychiatrist might say, trauma and frustration are at the minimum; whereas nourishment, comfort, and security are omnipresent at such a time. Needless to say, the supine position itself is conducive to relaxation whether in the sun or out. The suggestiveness of the position reduces mental activity and this, in turn, adds to the decrease in neuromuscular activity.

Having considered the usual mechanisms causing a relaxation response, let us turn to a more remote but likely mechanism that deserves attention. The reason for using the expression "more remote" is that although presently much more is known about the small motor system of proprioception in the central nervous system, this knowledge is based on the study of animals. In spite of this, it seems feasible to speculate as to the possibility of a direct effect of heat (temperature increase) on the peripheral proprioceptor mechanism in man. There have been increasing numbers of cases reported in which relaxation of muscles occurs following the application of extreme cold, in addition to those commonly reported wherein relaxation is attributed to the application of heat. This situation indicates that peripheral or even central proprioceptive mechanisms may be interesting areas for speculation.

When studied by electromyography, a large portion of the small nerve fibers of a cat show a background discharge to resting muscles. The small nerve fibers innervate the muscle spindles and regulate, in a graded manner, the sensory discharges from the sensory end organs. The pattern of skin stimulation may be of particular importance in this regulatory process.[12] Other studies have indicated that temperature changes may alter spindle activity although nothing is

known regarding this response in man.[3, 13] It is reasonable to speculate that either heat or cold could be a stimulus to reduce tonus. This is not a totally new idea since Krusen[14] observes, "The typical reaction to thermal changes is complex; there is, in general, vasodilatation on heating and vasoconstriction on cooling. But if the cold is extreme there may be vasodilatation; for example, if the hand is placed in very cold water at 41 to 50 degrees F. (5 to 10 degrees C.) for 5 minutes, the skin becomes bright red, similar to the color produced by a temperature of 113 degrees F. (45 degrees C.), arterioles, capillaries, arteriovenous aneurysms and veins are involved.... There may be considerable local increase or decrease in the flow of blood. These changes are produced partly through nervous reflexes." The reflexes Krusen refers to are probably those of the autonomic nervous system but, since he says that blood flow may either increase or decrease, what actually sets off the relaxation in the muscles themselves? It appears necessary to consider a gradient of temperature and time. The clinical point of interest is that today we find some physicians ordering brief ice packs instead of the previously prescribed 20 to 30 minute heat treatment; increase in range of motion, pain relief, release of muscle spasm, reduction in rigidity and relaxation are reported.[15, 16, 17] The packs are moist, very cold (approximately 34 degrees F.) and are applied for brief periods ranging from 30 seconds to 2 minutes. If a similar neuromuscular response occurs with changes in temperature, should we consider more specifically the importance of time? Is there a direct muscle spindle effect that can be elicited by more than one procedure depending on a time/temperature gradient? Can we reduce muscle tone clinically by using physical agents at the two extremes of temperature, if the time of the cold is brief, and the time of application of the heat is prolonged? It would be interesting to collect data on how frequently we find reduced tone in a spastic muscle following either of these procedures. It would also be interesting to experiment with these procedures on the same patient, varying the time and temperature of the applications. Possibly some averages could be obtained that would permit more specific prescriptions according to the patient's condition and immediate needs.

If there are two different physical procedures that can alter muscle tone in the same direction, relaxation, we should realize that the different procedures could be functioning through two different mechanisms. The response to heat could be a result of direct spindle response; whereas, the response to ice could be an autonomic nervous system response, the result of an optimum number of cold receptors firing in a short period of time. In cats, for example, the cold receptors have been found to respond to sudden stimulation by a very high frequency discharge.[13] In man it has been found that a drop from 37 degrees to 13 degrees C. (98.6 to 55.4 degrees F.) caused a maximum discharge within one to two seconds which then decreased exponentially to a plateau rate of firing. We should keep in mind that the stimulus for both warmth and cold is heat (temperature). Cold is not a positive quantity; it is the lack of heat. Although temperature by definition is a quantity, it in itself is not energy. The threshold stimulus for cold receptors is a fall in temperature at a rate of 0.004 degrees C./sec. We should also keep in mind that these receptors are stimulated from within as well as from without. That is, they respond to both internal body heat as well as to environmental stimuli;[18, 19] consequently, what is applied externally will not cause the same nervous system impression in all patients. So it is not surprising if patients respond differently. Sensation of any type is difficult to study in man, some authorities say impossible, since there is no accurate way to measure the response except to rely on the patient's impressions and verbal report.

Since we are looking at the effects of temperature, both high and low, in relation to the peripheral proprioceptive mechanism, we are intrigued by a recent report of the use of cold in multiple sclerosis patients. Ten patients were studied following a cool (80 degrees F.—27 degrees C.) bath. "All of the patients reported a feeling of relaxation with less muscle spasm and greater ease in the sitting and standing positions."[20] Is this a peripheral or central proprioceptive release? Or should we consider that we have a total systemic effect? We all agree that heat does tend to be debilitating for some patients, particularly those with general neuromuscular involvement. After all, when temperature rises or heat energy is added, in many cases there is an acceleration of the physiological processes in all systems, the extent of which depends on the dosage. Under such conditions the body does not function efficiently, and eventually, if the situation exists long enough, the body is under considerable stress. Reactions to cold include a slowing in cellular exchanges and a general decrease in function. Is this not more conducive to relaxation in some patients? How do the cool baths directly affect the muscles so as to provide the neuromuscular efficiency reported?

It is our belief that this entire topic of temperature change as related to relaxation of muscle

and neuromuscular efficiency is worthy of careful clinical study. There seems to be a need for laboratory study in this area as well.

SUMMARY

1. The term "relaxation" has various loosely defined connotations.
2. Relaxation refers to a lowered state of excitability manifested by various clinical signs.
3. The clinical signs indicate that there is a release of muscular tension which is, to some degree, less than previously observed.
4. Temperature change in relation to the rate of change may be the causative factor in bringing about relaxation.
5. Heat may cause relaxation and so may rapid cold.
6. The mechanisms for the release of muscle tension are unknown.
7. This is an interesting area to study in man, and data could be accumulated from well planned clinical studies.

REFERENCES

1. Jacobson, E.: You Must Relax, New York, McGraw-Hill Book Co., Inc., 1948.
2. Phillips, M.: Relaxation-conscious inhibition, So. Africa J. of Physio. XII-7 (Sept.) 1957.
3. Licht, S.: Therapeutic Heat, chapters by Millard, von Wessowetz, Fisher and Solomon, et al., New Haven, Elizabeth Licht, 1958.
4. Coyne, N.: Use and abuse of heat in physical medicine, Postgrad. M., 22:165-170, 1957.
5. Physiology Symposium, Part II: Bouman, H. D., Physical medicine in the clinical aspects of local heat application; Keller, A. D., The role of circulation in the physiology of heat regulation; Hines, H. M. and Randall, B. F., The effect of temperature and various methods used in physical medicine to increase temperature on local circulation, Phys. Ther. Rev. 30:12, 504-519 (Dec.) 1950.
6. Kovacs, R.: Electrotherapy and Light Therapy, Philadelphia, Lea & Febiger, 1949.
7. Sweeney, F. X., Horvath, S. M., Mellette, H. C. and Hutt, B. K.: Infrared heating of tissues, Arch. Phys. M. 31:493 (Aug.) 1950.
8. Wright, R.: Hydrotherapy in Psychiatric Hospitals, Boston, The Tudor Press, Inc., 1940.
9. Tuttle, W. W., Fitts, L.: The effect of heat produced by short wave diathermy on the activity of muscle, J. Laborat. Clin. M. 29, 1944.
10. Tuttle, W. W. et al.: The effect of autocondensation and high frequency current on tonus of skeletal muscle, Am. J. Physiol. 74:650-655, 1925.
11. Nitshke, R. A.: Effects of Infrared Radiation on Rat Skeletal Muscle (Unpublished) Master's Thesis, Dept. of Physiology and Pharmacology, Medical School, University of Missouri, (Aug.) 1950.
12. Hunt, C. C.: The reflex activity of mammalian small-nerve fibres, J. Physiol. 115: 456-469, 1951.
13. Granit, R.: Receptors and Sensory Perception, New Haven, Yale University Press, 1955.
14. Krusen, F. H.: Physical Medicine, Philadelphia, W. B. Saunders Co., 1941
15. Rockefeller, L. E.: The use of cold packs for increasing joint range of motion-A study. Phys. Ther. Rev. 38: 564 (Aug.) 1958.
16. Knott, M.: Report of a case of parkinsonism treated with proprioceptive facilitation technics, Phys. Ther. Rev. 37:229, (Apr.) 1957.
17. Bassett, S. W., Lake, B. M.: Use of cold applications in the management of spasticity, Phys. Ther. Rev. 38: 333, (May) 1958.
18. Fulton, J. F.: A Textbook of Physiology, Ed. 17, Philadelphia, W. B. Saunders Co., 1955.
19. Bard, P.: Medical Physiology, Ed. 10, St. Louis, C. V. Mosby Co., 1956.
20. Boynton B. L., Garramone, P. M., Buca, J. T.: Observations on the effects of cool baths for patients with multiple sclerosis, Phys. Ther. Rev. 39:297 (May) 1959.

Coming Meetings

April 18—19	Society of Neurological Surgeons, Olympic Hotel, Seattle
April 21—22	Carolinas-Virginias Hospital Conference, Roanoke Hotel, Roanoke, Virginia
April 25—28	Association of Western Hospitals, Statler-Hilton Hotel, Los Angeles
April 26—29	Industrial Medical Association, War Memorial Auditorium, Rochester, N. Y.
April 27—29	Middle Atlantic Hospital Assembly, Convention Hall, Atlantic City, N. J.
April 27—29	Mid-West Hospital Association, Municipal Auditorium, Kansas City, Mo.
May 2— 4	Tri-State Hospital, Palmer House, Chicago
May 4— 6	Southeastern Hospital Conference, Deanville Hotel, Miami Beach
May 5— 8	Student American Medical Association, Statler-Hilton Hotel, Los Angeles
May 11—13	Upper Mid-West Hospital Conference, Minneapolis Auditorium, Minneapolis

The Effects of Therapeutic Agents on Muscular Strength and Endurance

C. Etta Walters, Ph.D., Levon Garrison, M.A., Howard J. Duncan, B.S., Franklin V. Hopkins, B.S., and Jack W. Snyder, B.S.

The beneficial results of exercise are recognized more and more in the rehabilitation of patients, and methods of facilitating work output are constantly being sought.

The use of heat as an analgesic agent has its rightful place in therapy, but its widespread use in the relief of muscle spasm and in other neuromuscular disorders is being reanalyzed in light of new evidence.

The practice of warm-ups before activity is predicated on the belief that the increase in muscle temperature brought about by exercise increases work output and thus performance. It is now known that rise in muscle temperature occurs simultaneously with activity and is not just a by-product of work, and therefore it may contribute to muscular performance.

Studies of the application of heat either locally or to the entire body have shown conflicting results. Hall, Schamp, Brown and Davis,[1] Hall, Munoz and Fitch,[2] Nukada and Muller,[3] and Nukada,[4] have shown a decrease in strength and endurance with the application of heat. They attribute this reduction to alterations in blood flow through the muscle and skin of the exercising part and exclude the possibility that the rise in muscle temperature might be associated with the decrease in function. Asmussen and Boje[5] studied the effect of passive heating on physical performance and found an improvement which they thought to be due to an increase in local muscle temperature.

Steinhaus and Kelso[6] studied the effects of cold hip baths on various responses and found an improvement in tapping rate and in eye-to-leg muscle reaction time. Happ, Tuttle and Wilson[7] studied the physiologic effects of abdominal cold packs and found recovery from fatigue produced by strenuous exercise to be facilitated by the application of abdominal cold packs. The amount of oxygen required to perform a given amount of moderate work was decreased by the use of cold packs. As a result of cold pack application, pulse rate was significantly lowered, and while systolic pressure remained the same, diastolic blood pressure and venous pressure increased. Sills and O'Riley[8] found that the application of cold spray to the abdomen improved physical performance more than either preliminary rest or exercise. Grose[9] has studied the effect of forearm immersion in hot water (48 degrees C.) and of immersion in cold water (10 degrees C.) on strength and found hot water did not affect initial strength but caused a 34 per cent increase in the rapidity of fatigue, while the cold water decreased initial strength 11 per cent but did not change the fatigue level. Clarke, Hellon and Lind[10] studied the duration of sustained contractions of the human forearm at different muscle temperatures and found the optimum temperature for sustained contraction to be at 18 degrees C. Immersion of the forearm in water at 18 degrees C. for 30 minutes produced a muscle temperature of about 27 degrees C. There was a decrease in the duration of the contraction above and below a muscle temperature of 27 degrees C. They found the rate of blood flow through the muscle to be greater when the temperature was increased, and the postexercise hyperemic response was greater for a given duration of contraction in water at 34 degrees and 42 degrees C. than at lower temperatures. Recently, Bassett and Lake[11] and Boynton et al.[12] have studied the effects of local application of cold and of total immersion in cold water (Hubbard tank) upon spasticity and upon neuromuscular coordination. The temperature of the water was 27 degrees C. In both reports, relief from spasticity was obtained and patients improved in neuromuscular coordination and mobility as a result of the cold application. Relief was obtained in 70 per cent of the cases.

It is, therefore, the purpose of this investigation to study the effects of heat and cold applied to the abdomen and of general warm-ups on the strength and endurance of voluntary muscular contraction in the human subject. Strength in

From the Research Laboratories of the Department of Physical Education and Recreation, The Florida State University, Tallahasee, Florida.

Table 1

Heart Rate and Work Following Specified Pre-Conditions

	Control						Cold Pack					
	Heart Rate in Beats/ min.		Work in Lbs.				Heart Rate in Beats/ min.		Work in Lbs.			
S	End of Work	Range*	Total	1st min.	last min.	Exp** order	End of Work	Range*	Total	1st min.	last min.	Exp** order
1	102	77-62	6436	1343	827	4	84	73-63	6122	1521	683	3
2	108	81-68	6813	1298	951	4	84	79-67	6892	1274	1026	3
3	108	77-66	6882	1519	978	3	108	83-74	7229	1479	996	2
4	120	78-73	7569	1582	966	3	142	99-86	8025	1484	1064	2
5	120	99-92	7018	1709	774	1	120	98-75	7878	1629	1122	4
6	98	88-78	7123	1546	953	1	144	129-106	8627	1696	1234	4
7	96	89-86	5497	1347	633	2	120	94-79	5213	1290	684	1
8	108	79-61	5921	1739	759	2	108	-51	6545	1625	845	1
M	108	84-73	6657	1510	855		114	94-75	7066	1500	958	
	Warm-Up						Heat Pad					
1	120	96-83	6227	1550	747	2	84	74-61	6696	1523	870	1
2	132	109-95	6021	1274	840	2	108	88-73	6523	1203	938	1
3	132	111-93	7893	1524	1100	1	90	66-60	6682	1523	890	4
4	136	142-102	7004	1498	980	1	144	105-90	7124	1589	1005	4
5	138	123-101	6500	1647	998	3	120	91-82	6547	1688	820	2
6	156	137-112	8377	1536	1113	3	96	91-85	7428	1464	999	2
7	156	108-107	5518	1337	733	4	120	101-97	5219	1394	549	3
8	156	119-100	6726	1801	831	4	102	92-75	6201	1747	831	3
M	141	118-99	6784	1521	955		108	89-78	6552	1516	863	

* The first and fifth minutes after work

** Order in which experiment was performed

this study is measured in terms of the amount of isometric tension developed through repeated contractions. Since physiological work is being performed, the tension developed will hereafter be referred to as "work."

PROCEDURE

The subjects of this study were 8 male students majoring in physical education at The Florida State University. Their ages ranged from 19 to 30 years. The subjects were arbitrarily assigned to 4 subgroups. Each subgroup started with a different pre-work condition and rotated through the other three groups in the following manner: control, heat pad, warm-up, cold pack. The subject performed the test at the same hour once a week, at the same place and under the same environmental conditions except for the experimental pre-work variable. All work started 5 minutes after the pre-work conditions were complete. The pre-work conditions consisted of the

Table 2

Average Differences in Work from Control Under Various Conditions

Condition	Work in Pounds				
	Total	1st 3 contractions	1st 15 sec.	1st min.	Last min.
COLD PACK					
Work	409	0	8	-30	103
No. of subjs. showing imp.	6	3	4	2	7
WARM-UP					
Work	207	3	8	33	200
No. of subjs. showing imp.	4	5	5	4	6
HEAT PAD					
Work	-305	1	-2	6	8
No. of subjs. showing imp.	3	3	3	5	5

following: a. Control: This was an 11 minute period of inactivity before the work period started, with the subject resting in a supine position. b. Cold pack: An ice pack was applied to the abdomen of the subject in a lying position for 11 minutes. c. Warm-up: The subject performed the chair step test on a 17 inch high chair for 5 minutes in time to a metronome set for 30 steps/minute. d. Heat pad: An electric heat pad set at the high temperature position was applied to the abdomen of the subject in a lying position for 11 minutes.

The work consisted of 172 isometric elbow flexor contractions (5 minutes and 45 seconds) at the rate of one contraction every 2 seconds measured on a cable tensiometer.[13] The metronome beat every second and the subject was instructed to pull with one beat and relax with the next beat. The subject performed the work in a supine position with the knees bent. The cable for the tensiometer was attached to the wall facing the subject who was positioned so that the forearm was vertical at a 90 degree angle with the humerus. The strap was held in the hand with the forearm in mid-position. Thus, the pull came at the end of the lever and was more fatiguing than if the strap had been placed closer to the elbow joint. The subject was also positioned so that he could not pull from his shoulders; his elbow was kept close to his side to keep the pull in a straight line from the wall to the shoulder. As the subject contracted his elbow flexor, an operator read aloud the amount pulled which was recorded by an assistant. This procedure, along with constant encouragement by the operator, acted as a motivating device. The subject was urged to make each contraction his maximum.

Since the heart rate at rest, when taken as a single statistic, is unreliable, no attempt was made to take the resting heart rate, except in certain test cases. The heart rate was taken, however, the first 5 seconds following work, as this has been found to most nearly parallel that taken during work.[14] The measurement of heart rate was continued for the remainder of the first minute and for every 60 seconds until 5 minutes after exercise.

The pounds pulled with each contraction were totaled for work after each variable and for the following specified periods: The first three contractions, excluding the first one (it was felt by the investigators that the first contraction was a matter of adjustment to the situation), the first 15 seconds, and the first and last minutes of work. The difference in average total work for the 8 subjects following the various pre-work conditions was obtained from their control and for the above mentioned statistics. The heart rate was similarly determined for each pre-work condition and for each of the 5 minutes after work.

RESULTS

An analysis of variance did not reveal a statistically significant difference between work produced under various pre-work conditions. However, the trend of the data bears further scrutiny. From table 1 it is possible to follow each subject and compare his heart rate rise with exercise and his variation with different work conditions.

The application of cold packs prior to activity increases the average work output by 409 pounds per person over control conditions (Table 2), with 6 out of the 8 subjects (75 per cent) showing an increase. This would seem to indicate that a statistically significant difference might be found with more subjects and better controls.

Figure 1 was constructed from selected work samples which were taken every 7 contractions and gives a picture of the decrement in work output as the exercise continues. It is apparent from it and from table 2 that there is a depression in work output under cold pack pre-work condition during the first minute of activity but, after that, work is increased over the control and continues to be higher than the control for the rest of the exercise. Since the total amount of work is higher, it would seem that cold packs aid in the postponement of fatigue.

The relative cost of work under the various conditions can be assessed from the heart rate. From table 3, it is apparent that the cost of work under cold pack conditions is small when

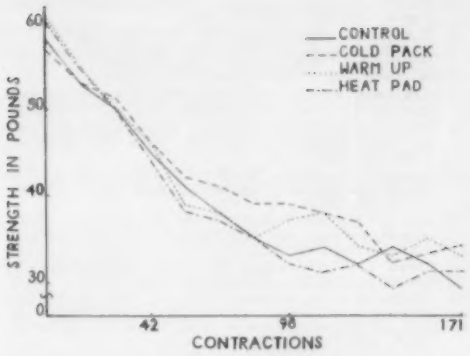

Figure 1. Work curves under various pre-exercise conditions.

the extra work done (409 lbs.) is considered. Five minutes after the end of work the heart rate is only 2 beats above control conditions. From the work of previous investigators[7] and from 4 test cases from subjects of this experiment, the heart rate decreases significantly after the application of cold packs to the abdomen.

Clarke, Hellon and Lind,[10] in their work on forearm immersion and sustained contractions, demonstrated the critical variable in sustained contractions to be the temperature of the muscle. Above a muscle temperature of 27 degrees C., they postulate, there is a rapid increase in metabolism which results in a fast accumulation of metabolites so as to cause fatigue. Below a muscle temperature of 27 degrees C. there is an interference of nervous or neuromuscular transmission brought by cooling and many of the superficial muscle fibers do not contract. It may be only a coincidence that Boynton, Garramone and Buca[12] used a water temperature of 27 degrees C. in the Hubbard tank and found an increase in neuromuscular coordination and mobility. They state that it made little difference whether the water was 21 or 27 degrees C. Clarke et al.[10] also point out that there is a variation in the water temperature that produces a critical temperature of 27 degrees C. in the muscle, and this is dependent upon the thickness of the subject's forearm. Thus the range in immersion temperature is, no doubt, subject to individual variations on the basis of body build.

Since this study did not attempt to determine the physiologic responses, other than heart rate, to activity under the various conditions, one can only speculate as to the cause of increase in work output shown by 75 per cent of the cases

Table 3

Average Differences in Heart Rate from Control Under Various Conditions

Pre-Work Condition	Heart Rate in Beats/ min. after activity		
	1st 5 sec.	1st min.	5th min.
Cold Pack	6	10	2
Warm-up	33	34	26
Heat Pad	0	5	5

after the application of cold packs. It may be possible that the cold packs influenced the temperature of the muscle through the circulation. At first the temperature may have been decreased below the critical value producing a depression in work and as a result of activity there was a warming-up to a more desired temperature, resulting in more work.

The subjects, when performing after cold pack conditions, felt less fatigue and expressed the opinion that they could continue indefinitely.

Warming-up before work brought an average improvement in total work of 127 pounds over the control, with only 4 of the 8 subjects (50 per cent) showing a gain. The 5 minute chair-stepping test is a strenuous one and caused an average heart rate of 169 beats/minute, with a range of 150 to 192 beats. Five minutes after the chair-stepping test, the mean heart rate was 106 beats. It is, therefore, small wonder that the heart rate increase over the control after the 172 contractions was 33 beats, and 5 minutes after the exercise it was still 26 beats over that of the control (Table 3). In view of this it is interesting that 61 per cent of the subjects had an increase in their first three contractions and in work output the first 15 seconds under warm-up conditions. Further study along this line may be of importance to the athlete and may help to answer some of the unsolved problems of warm-ups before activity.

When the body is heated by means of an electric heat pad, there is an average decrement of total work of 105 pounds over the control, with 5 of the 8 subjects showing a decrease, indicating that this may not be a desirable method of increasing work output. Although the work was less than after control conditions, the heart rate during activity remained the same, and 5 minutes after the contractions it was 5 beats above that performed after control conditions. Data ob-

tained from 4 subjects of the experiment and from 5 additional subjects not in the present study showed the heart rate to increase approximately 4 beats/minute after an 11 minute application of heat to the abdomen.

CONCLUSIONS

The results of this experiment, showing that 75 per cent of the subjects did more work after cold pack applications, suggests that this may be an efficient therapeutic agent for increasing work output and alleviating fatigue. The improvement by only 50 per cent of the subjects performing after warm-ups and of 38 per cent of the subjects working after heat pad applications indicates that these may not be desirable methods of augmenting work or of postponing fatigue.

REFERENCES

1. Hall, V. E., Schamp, H. M., Brown, G. E. and Davis, M. N.: Effect of Kenny fomentation on the strength of voluntary muscular contraction in man, Arch. Phys. M., 25:96-99, 1944.
2. Hall, V. E., Munoz, E., and Fitch, B.: Re-education of the strength of muscle contraction by application of moist heat to the overlying skin, Arch. Phys. M., 28: 493-499, 1947.
3. Nukada, A., and Muller, E. A.: Hauttemperatur und Leistungsfahigkeit in Extremitaten bei dyamischer Arbeit, Arbeitsphysiologie, (Now, Internat. Zschr; angew. Physiol.) 16:61-73, 1955.
4. Nukada, A.: Hauttemperatur und Leistungsfahigkeit in Extremitaten bei statischer Haltearbeit, Arbeitsphysiologie (Now, Internat. Zschr; angew. Physiol.), 16:74-80, 1955.
5. Asmussen, E., and Boje, O.: Body temperature and capacity for work, Acta physio. scand., 10:1-23, 1945.
6. Steinhaus, A. H., and Kelso, A.: Improvement of visual and other functions by cold hip baths, War Medicine, 4:610-619, 1943.
7. Happ, W. P., Tuttle, W. W., and Wilson, M. J.: The physiologic effects of abdominal cold packs, Res. Q., 20:153-169, 1949.
8. Sills, F. D., and O'Riley, V. E.: Comparative effects of rest, exercise, and cold spray upon performance in spot running, Res. Q., 27:217-219, 1956.
9. Grose, J. E.: Depression of muscle fatigue curves by heat and cold, Res. Q., 29:19-31, 1958.
10. Clarke, R. S. J., Hellon, R. F., and Lind, A. R.: The duration of sustained contractions of the human forearm at different muscle temperatures, J. Physiol., Lond., 143:454-473, 1958.
11. Bassett, S. W., and Lake, B. M.: Use of cold applications in the management of spasticity, Phys. Ther. Rev., 38:333-334, 1958.
12. Boynton, B. L., Garramone, P. M., and Buca, J. T.: Observations on the effect of cool baths for patients with multiple sclerosis, Phys. Ther. Rev., 39:297-299, 1959.
13. Clarke, H. H.: Improvement of objective tests of muscle groups by cable-tension methods, Res. Q., 21:399-419, 1950.
14. Cotton, F. S., and Dill, D. B.: On the relation between the heart rate during exercise and that of the immediate post-exercise period, Am. J. Physiol., 3:554-556, 1935.
15. Walters, C. E., Stewart, C. L., and LeClaire, J. F.: Effects of short bouts of isometric and isotonic contractions on muscular strength and endurance, Am. J Phys. M. (in press).

State Examinations for Physical Therapists

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Physical therapy, as a profession, is now in the process of securing a legal status in the United States. At the time this study was undertaken, laws had been enacted in 31 states which provide for the licensure or registration of physical therapists. According to the questionnaire returns, 18 of these states are prepared to use the examination provided by the Professional Examination Service of the American Public Health Association; in 12 states examinations are obtained from other sources. In New Mexico the law requires only that the person be a graduate of an approved school. It was the purpose of this study to determine the current examination practices followed in all states having such laws.

Pennsylvania was the first state to enact legislation regulating the practice of physical therapy. Its law was passed in 1913 under the Regulation of the State Board of Medical Education and Licensure. New York passed legislation regulating the practice of physical therapy in 1926. Connecticut enacted legislation in 1941. The fourth state to be so regulated was Hawaii in 1945 under the Regulations of the Territorial Board of Health. In 1947 Maryland enacted legislation concerning physical therapy and the State of Washington in 1949.

Although during the period from 1913 to 1949

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only six states enacted legislation which regulated the practice of physical therapy, in the next decade there were 25 states which took this step. After 1949 the following states enacted legislation:

Date	*Laws*	*States*
1951	8	Florida, Georgia, Illinois, Massachusetts, Minnesota, New Hampshire, North Carolina, Oklahoma
1952	2	Arizona, South Carolina
1953	4	Arkansas, California, New Mexico, Wisconsin
1955	5	Delaware, Maine, Nevada, South Dakota, Tennessee
1957	4	Alaska, Indiana, Nebraska, Vermont
1958	2	Kentucky, Virginia
1959*		

In relation to state legislation, an editorial in the May, 1951, issue of the *Physical Therapy Review* declared:

> No one of us can afford to be apathetic in regard to state legislation. Bills are introduced and acted upon in direct proportion to the interest and pressure which is evident to the legislators. Such interest and influence may be by individuals, groups, or both, but it must be present. Whether it is for a desirable bill or to defeat an undesirable one, the necessity for positive action is present. Poor legislation is the direct responsibility of that group upon which it reflects. We must be aware of activity in legislation affecting our field and, what is even more important, we must be prepared to take constructive action in relation to it.[3]

It is at the state level that physical therapists have exerted their chief political efforts. The physical therapy profession is still young, however, and has much to learn about politics.[7] In order to assist the physical therapists in states initiating legislation regulating the practice of physical therapy, the Amercan Physical Therapy Association distributed to the state chapters in 1949 a model law which could be used as a guide in drawing up such laws. The first model law, which was prepared with the assistance of T. V. McDavitt, Director of the Bureau of Industrial and Personnel Relations of the American Medical Association, was permissive in nature.[8]

After actual experience in many states it was found that in order to be effective, "... a law must do more than permit registration of those who meet the prescribed qualifications and who desire to become registered."[8] Based on an analysis of existing laws and the conviction of the Board of Directors of the American Physical Therapy Association that stronger laws are necessary to protect the public, the Association in September, 1958, had prepared by the Association's legal counsel, Richard T. Davis of Sherpick, Regan and Davis of New York City, a preliminary draft of component sections of a mandatory physical therapy practice act.[8]

> The component sections are based upon the premise that mandatory licensure is necessary to protect the public. Enforcement of mandatory licensure will (1) ensure the public that those persons who practice physical therapy are qualified by education and meet the requirements of the state, (2) ensure physicians practicing in any branch of medicine that the persons practicing physical therapy are qualified to do so, (3) serve to remove the hazard to the public of unlicensed practice of physical medicine as presently exists where mandatory licensure is not in effect. In this sense, the mandatory law will serve to protect the patient in that to receive physical therapy, the patient must first consult a licensed physician. The patient cannot be treated by "the man down the street" who diagnoses, prescribes and treats without the basis of medical education.[1]

The present model law provides that a Board of Physical Therapy be established which shall consist of three members who shall be appointed by the Governor. It is pointed out that in some states there might be opposition to creating a separate Board of Physical Therapy. Under these circumstances the Board could be established as a part of the State Board of Medical Examiners.

In addition to specific educational and training requirements, as set by the laws, there was also established a requirement for a written examination in many of the states. According to Dr. Lillian Long, (Director, Professional Examination Service, American Public Health Association) the problem of evaluating professional competency is one of the aspects of licensing which creates problems for every profession.[6]

> The second is that whereas licensing is statewide, professions have a nationwide orientation. The problems created for a profession by the existence of as many as fifty different laws and licensing boards are themselves twofold. They are the difficulties of maintaining a national standard of competency in spite of the diversity of licensing practices, and of preventing unreasonable restrictions on the freedom of the members of a profession to move from state to state.[6]

In many of the states the early examinations prepared for the evaluation of professional ability were essay in form. It became apparent to

* Since the initiation of the study, physical therapy practice acts have been enacted in Colorado, North Dakota, Ohio, Oregon, and Utah.

TABLE I

Dates of Enactment and Types of Laws

Date	Number of Laws	Mandatory or Permissive		States	
1913	1	M		Pennsylvania	
1926	1	M		New York	
1941	1	P***		Connecticut	
1945	1	M		Hawaii	
1947	1	M		Maryland	
1949	1	P		Washington	
1951	8	M**	M	Florida	Minnesota
		P	P	Georgia	New Hampshire
		P	(P)*	Illinois	(North Carolina)*
		M**	P	Massachusetts	Oklahoma
1952	2	M	M	Arizona	South Carolina
1953	4	M**	M	Arkansas	New Mexico
		M	M	California	Wisconsin
1955	5	P	M	Delaware	South Dakota
		(M)*	M	(Maine)*	Tennessee
		M**		Nevada	
1957	4	P	M	Alaska	Nebraska
		M	M	Indiana	Vermont
1958	2	M	M	Kentucky	Virginia

( )*Information obtained from sources other than questionnaire.

**Originally permissive.

***Since the survey, Connecticut's law has been amended so that licensure is now mandatory.

the examiners in some of the states that this was not the most satisfactory method of testing. It was felt that by an objective test the grading would be more accurate, the examinee would have the advantage of a wider subject coverage, and statistical procedures could be used for improving the examination, and for comparing groups and individuals.[4]

Not only has the American Physical Therapy Association been active in presenting model laws as a pattern for the state laws, but it has continued to give active support, encouragement, and advice to states in relation to their licensure or registration problems. As the need for more objective testing was recognized, the members of the American Physical Therapy Association, through their professional organization, provided funds so that an examination could be prepared in cooperation with test specialists. They also provided funds so that the fee would be such that the states could easily use the examination. In 1953 the Professional Examination Service started to work with the American Physical Therapy Association in preparing this examination. According to Dr. Long:

Significant as was this financial support, it is of

TABLE 2

General Information

States	Year Law Enacted	Type of Law	Year First Examination Given	May Practice Before Filing	Must File	Must Pass an Examination Before Practicing
Alaska	1957	P		X		
Arizona	1952	M			X	
Arkansas	1953	P		X		
	1959	M				
California	1953	M	1954	X		
Connecticut	1941	P**		X		
Delaware	1955	P	1959	X		
Florida	1951	P			X	
	1957	M			X	
Georgia	1951	P		X		
Hawaii	1945	M			X	
Illinois	1951	P		X		
Indiana	1957	M	1958		X	
Kentucky	1958	M	1959		X	X
Maine*	1955	M				
Maryland	1947	M	1949		X	
Massachusetts	1951	P	1956		X	
	1958	M				
Minnesota	1951	M	1956			
Nebraska	1957	M	1958		X	
Nevada	1955	P	1957	X		
	1959	M				
New Hampshire	1951	P	1954	X		
New Mexico	1953	M			X	
New York	1926	M	1926	X		
North Carolina*	1951	P				
Oklahoma	1951	P	1954		X	
Pennsylvania	1913	M	1920		X	X
South Carolina	1952	M	1953	X		
South Dakota	1955	M	1956	X		
Tennessee	1955	M	1957		X	
Vermont	1957	M	1958	X		
Virginia	1958	M	1958			X
Washington	1949	P		X		
Wisconsin	1953	M	1954		X	

* Obtained from sources other than the questionnaire.

** Since the survey, Connecticut's law has been amended so that licensure is mandatory.

less importance than the active participation of your membership in the construction and maintenance of the test. This participation comes to the program in four ways: from the examination committee of the American Physical Therapy Association; from physical therapists who write questions; from those who review questions; and, never let it be forgotten, from candidates who take the test.[6]

The Board of Directors of the American Physical Therapy Association appointed a Committee on Examinations of five members. In cooperation with the Professional Examination Service, this committee helped to prepare both an examination to evaluate professional competency of foreign trained physical therapists for admission to membership in the Association and an examination to be used by the state licensure or registration boards. Requests for multiple choice questions were sent to physical therapists and physicians throughout the country. Selected items were then sent out for review of content by physicians and basic scientists as well as by persons in the physical therapy field who were asked to reword and revise the items if indicated, to check the items for accuracy, and to classify them as difficult, moderately difficult, or easy.

The items were returned and again reviewed by the education consultant, Dorothy Hewitt, together with the members of the committee on examinations. This group selected questions to be included after a careful analysis of existing laws regarding requirements specified for examination. The number of questions in each subject area was determined on the basis of the number of hours in each area of the field spent in the physical therapy curriculum as determined by the Essentials for an Acceptable School of Physical Therapy as set by the Council on Medical Education and Hospitals of the American Medical Association.[10] The objective examination which was prepared was composed of 310 multiple choice questions.

> It is divided into three parts: Part I covers the basic sciences and has 115 questions; Part II, the clinical sciences with 60 questions; Part III, physical therapy theory and procedures with 135 questions. The test is given in one day in three periods totaling seven hours.[6]

On the basis of the number of examinations given, an item analysis has been carried out by the Professional Examination Service. The Examination Committee of the American Physical Therapy Association has then revised the examination on the basis of the results of the item analysis findings.

The Professional Examination Service provides the examination for the states which use it, supplies the directions for administration and interpretation, corrects the examination, and returns the results to the licensing board in a short time. The Service does not set the passing grade, but if information on this point is requested it will advise the licensing board. The Professional Examination Service has a consultant, Charles B. Frasher, who will visit the Boards and discuss specific needs and examination procedures with them.[6] In many states this examination is used alone, while in others it is administered in combination with oral and/or practical examinations. In some states, examinations other than that of the Professional Examination Service are used. These also may be given in combination with oral and/or practical examinations.

For the purposes of this study the methods of testing in the various states have been investigated, including the nature of the oral and practical examinations. An attempt has been made to determine the mechanics of preparing, grading, and validating written examinations other than the examination prepared by the Professional Examination Service.

METHOD OF STUDY

Available material on current legislation in the physical therapy field was reviewed and a questionnaire was prepared. This was reviewed by members of the faculty and graduate students in the Division of Physical Therapy at Stanford University, revised, and again reviewed by members of the faculty and by Dr. Lucien Kinney, in the School of Education at Stanford University.

Persons concerned with state examinations for physical therapists in California, Oklahoma, Wisconsin, and Washington were selected for a pilot study in which the initial questionnaire was used. A copy was also sent to Dorothy E. Voss, Consultant, Chapter and Membership Department of the American Physical Therapy Association, who reviewed it together with Dr. Lillian Long, of the Professional Examination Service. Many helpful suggestions made by persons completing the questionnaire were incorporated into the final questionnaire. The questionnaire included the following material:

Section A dealt with the status of the law in each state, whether permissive or mandatory. It was designed to determine how the law was interpreted and whether or not a physical therapist could practice in the state before he filed application.

Section B was constructed to determine the number of persons licensed or registered in each state and by what method they were so licensed or registered.

Section C dealt with the actual administration of the examination, e.g., scheduling of examinations, persons who administer or proctor the examination.

Section D was divided into two main categories. Part I was to be answered by states using the examination prepared by the Professional Examination Service. Part II was to be answered by those providing their own examination, in order to determine the mechanics of administering, grading and validating such examinations.

Section E investigated the methods used in giving oral and practical examinations.

A final section was provided so that the persons completing the questionnaire would have an opportunity to discuss at greater length the methods used in giving written, oral, and practical examinations, to discuss their opinions regarding weaknesses and strengths of examination methods, and to offer any suggestions for improving testing methods.

TABLE 3

Number of Persons Licensed or Registered

States	Total Number Licensed or Registered	Means of Licensing or Registration		
		Under "Grandfather Clause"	By reciprocity or Endorsement	By written Examination
Alaska	12	10	2	
Nevada	12	10	1	1
Vermont	28	20**	5	3
South Dakota	29	21	7	1
Arkansas	32			
New Mexico	39	3		
Delaware	40	38	1	1
Hawaii	41			
Nebraska	41	38		3
Kentucky	42*	42		
New Hampshire	43	13	30	
South Carolina	59	32	11	15
Oklahoma	71	29	3	39
Tennessee	75*	61	3	11
Arizona	94	12	82	
Georgia	115			
Washington	190 (approx.)			
Indiana	200*	176	24	
Florida	207	151	23	33
Minnesota	289			1
Illinois	429	279	23	127
Maryland	432	195	22	215
Wisconsin	430	182	4	244
Massachusetts	594	537	8	49
Pennsylvania	814			
California	1628***(Registered)	1071		557
New York	1707*	200		1507

Note:

Discrepancies in totals may be due to varied interpretation of the questionnaire; all figures reported have been included.

*Total not on questionnaire; obtained by adding figures from second, third, and fourth columns.

**"Under original waiver."

***Obtained from a list of Registered Physical Therapists from the Department of Professional and Vocational Standards, Board of Medical Examiners.

RESULTS OF SURVEY

Questionnaires were completed and returned by persons concerned with the licensure or registration examination for physical therapists in 29 of the 31 states involved in the survey as follows:

Alaska
Arizona
Arkansas
California
Connecticut
Delaware
Florida
Georgia
Hawaii
Illinois
Indiana
Kentucky
Maryland
Massachusetts

Minnesota	Pennsylvania
Nebraska	South Carolina
Nevada	South Dakota
New Hampshire	Tennessee
New Mexico	Vermont
New York	Virginia
Oklahoma	Washington
Wisconsin	

Questionnaires were not received from Maine and North Carolina. However, the person to whom the questionnaire was sent in North Carolina replied that she did not have time to complete the questionnaire but sent printed material concerning the legislation in her state. Appropriate portions of this material have been included in the report. Of the 29 questionnaires returned, not all parts were answered completely.

It is interesting to note that laws in 25 of the 31 states with legislation at the time of this study were enacted since 1950. (Table 1) At the time of the survey 22 states had mandatory laws, while nine states had permissive laws. The majority of the more recent laws are mandatory. According to the information in the questionnaire, there is no separate physical therapy law, as such, in Pennsylvania but regulation is provided through an amendment to the Medical Practice Act. The amendment gives the State Board the power of regulation of all groups who "pretend to the practice" of medicine. The Medical Practice Act is a mandatory law and all groups who are regulated by it accept licensure as mandatory.

That the mandatory and permissive characteristics of laws vary from state to state becomes apparent in table 2. It will be noted that in certain states having mandatory laws, a physical therapist is required to file application before practicing; and in other states, a physical therapist may practice before filing.

Number Licensed or Registered

The relationship between the total number of persons licensed or registered and the method by which they reached this status is given in table 3. Review of the table indicates that the 15 states with licensed or registered persons numbering over 50 are also those states which have had the most experience with administering written examinations, as might be expected. The number of persons who have taken a written examination and the rates of failure are indicated in table 4.

Persons in 23 states replied to the question, *"If an applicant fails, can he retake the examination?"* All of the replies were in the affirmative. In 16 states there is no limit to the number of times an applicant may repeat the examination. In seven states there is a limit of two or three times. In some instances certain requirements must be met before the examination can be taken a second time.

The examination for physical therapists is given most commonly twice a year (12 states). Less frequently it is given once (five states), in one case three times, and in one case four times each year. The Board of Medical Examiners has the final responsibility for the examination in 12 states. In 10 states a Physical Therapy Board or Committee is responsible. A number of boards and bureaus are utilized to screen the applications and also to approve or to refuse the applications.

In all of the states replying, the Board of Medical Examiners or a Physical Therapy Committee is responsible for the administration of the oral and practical examination where these tests are used. Various boards and agents, however, are responsible for administering the written examination.

States Using the Professional Examination Service Examination

Eighteen of the 31 states are prepared to use the examination provided by the Professional Examination Service;† these states are the following:

Alaska	Nevada
Arizona	New Hampshire
California	North Carolina
Connecticut	Pennsylvania
Delaware	South Carolina
Florida	South Dakota
Hawaii	Tennessee
Kentucky	Vermont
Massachusetts	Washington

To date no examination has been given in Hawaii, Arizona, or Alaska. In Hawaii, according to the information received in the questionnaire, "In order to obtain a permit the applicant must show that he meets the qualifications set forth in our regulations—(be a) graduate of an approved school, member of certain national organizations, etc." In Arizona, when it is necessary to use a written examination, it will be provided by the Professional Examination Service. To date an examination has not been used.

Thirteen replies were received to the question,

† Since the study Colorado, Illinois, North Dakota, Oregon, Utah, and Virginia have agreed to use the Professional Examination Service examination.

"Is the examination used in combination with an oral or practical examination?"

Examination Used	*Number of States*	*States*
Professional Examination Service examination used alone	9	Delaware Massachusetts Nevada New Hampshire Pennsylvania South Carolina South Dakota Vermont Washington
Professional Examination Service examination used in combination with oral examination	1	Arizona
Professional Examination Service examination used in combination with oral examination and practical examination	3	California Florida Tennessee

There were 12 replies to the question, *"What comments have you received from applicants concerning the examination?"* One person did not feel qualified to reply as she had not talked with many candidates about the examination. Seven of the persons completing the questionnaire replied that from the comments they hear, the examination is difficult. Eight reported that, according to their findings, the examination is fair. No comments were made that the examination is either unfair or easy. One person stated that he had no comment. It would appear that even though the examination is thought to be difficult, it is considered to be fair.

Of the 12 persons answering the question, *"Has your Board or Committee been satisfied with the service of the Professional Examination Service?"* nine persons replied definitely in the affirmative. One person stated that this was difficult to ascertain as only one examination had been given. In one state the first examination was given in April, 1959. The other response was a qualified "yes." In this case the Chairman of the Board is not satisfied as he did not wish to change from an essay type of examination to the objective form used by the Professional Examination Service. However, the person completing the questionnaire stated that the other members of the Board seemed to be satisfied. Three of the persons answering in the affirmative made the following comments:

1. In a small state (an objective examination) eliminates any question of favoritism.
2. We feel that we are giving the most fair examination prepared by persons who are experienced in testing procedures.
3. Our Board feels it is an excellent examination. The Board is hopeful that eventually all states will use it.

STATES NOT USING THE PROFESSIONAL EXAMINATION SERVICE EXAMINATION

Twelve of the 31 states with legislation regulating the practice of physical therapy used a written examination obtained from sources other than the Professional Examination Service of the American Public Health Association as follows:

Arkansas	Minnesota
Georgia	Nebraska
Illinois	New York
Indiana	Oklahoma
Maine	Virginia
Maryland	Wisconsin

All or part of the questionnaires were completed by persons in all states except Maine. In Arkansas no test has been given. As stated previously, in New Mexico the law requires only that the person be a graduate of an approved school. The section of the questionnaire from Georgia which deals with the written examination was not completed. The following information is therefore based on replies from nine states.

Type of Examination	*Number of States*	*States*
Objective examination	4	Illinois Minnesota Oklahoma Virginia
Essay type of examination	2	Indiana New York
Combination of essay and objective questions	3	Maryland Nebraska Wisconsin

The next question in this section was designed to determine whether or not the written examination is used in combination with an oral and/or practical examination. Four of the states completing this question use the written examination in combination with an oral and/or practical examination.

Type of Examination	*Number of States*	*States*
Written examination in combination with oral examination	1	Maryland
Written examination in combination with oral and practical examination	3	Illinois New York Wisconsin

A further question in this section was designed to determine the source of the questions in the states not using the examination provided by the Professional Examination Service and the personnel responsible for the final selection of test items from the questionnaires.

Nine persons replied to the question concerning the composition of the written examination. The number of questions in the written examination varies from approximately 110 questions in Illinois to 425 questions in Oklahoma. In some instances the examination was divided into specific categories. In certain examinations there was a definite number of questions included in each section.

In answer to the question, *"Do you think that an oral and/or practical examination should supplement the written examination?"* 14 replies were received. The following persons gave affirmative answers. Some of the repetitious or less significant comments have not been included.

1. A good physical therapist should be able to express himself verbally. Therefore, I think an oral examination can be justified. A practical examination often reveals weaknesses that a written and/or oral examination do not.
2. We feel that this gives us a fairer idea of an applicant's ability. By being allowed to demonstrate technics, the subject is released from some of the tension of the examination and some persons are then better able to express themselves.
3. It gives a fairer chance to those who might not do well with a written examination.
4. It reinforces the borderline applicant.
5. I believe it would be of help to the physical therapist who has been in the field a number of years. With a written examination it appears that the more recent graduates have the greater opportunity to do well, although the Professional Examination Service states there are questions that are easier for new therapists and some questions that are easier for the more experienced.
6. It provides supplemental information. It not only gives the opportunity (for the candidate) to demonstrate skill in the clinical situation, but it balances the written grade.
7. The oral and practical examinations are especially good for the foreign trained physical therapist or any applicant who has difficulty expressing himself in writing.
8. I feel that oral and practical examinations should supplement the written examination. If we had our own Board consisting of physical therapists, we would strive for that. Time is an element, however, with the Board as it is and that is the main reason they are not given.
9. We have found that an oral and practical examination is important in several respects. Often we have found students who were superior in their written examination

State	*Sources of Questions*	*Final Decision in Question Selection*
Illinois	Written by physical therapists and physicians.	Individual members of the physical therapy committee are assigned certain subjects by the committee. Their decisions are final.
Indiana	Written by physical therapists and physicians.	Physicians on the Board.
Maryland	Written by the Board of Physical Therapy Examiners. All are M.D.'s. These questions are reviewed annually by physical therapists.	Board of Physical Therapy Examiners.
Nebraska	Written by physical therapists who constitute the Board of Examiners.	Physical Therapy Board of Examiners and the Department of Health.
New York	Written by physical therapists and physicians in the area where the Medical Examiner works.	Medical Examiner.
Virginia and Minnesota	Committee on physical therapy.	Committee on physical therapy.
Wisconsin	Each member of the physical therapy committee writes questions on different phases of the material required by law.	Physical therapy committee.

TABLE 4

Written Examinations

States	Persons Taking	Passed	Failed	Percentage of Failures	Number Repeating
California	659***	597*	62***	9.4*	
Delaware	1	1			
Florida	34	33	4	11.8*	3
Illinois	127	127	39	30.7*	39
Indiana	2		2	100.0	
Maryland	215	214	1		
Minnesota	1	1			
Nebraska	3	3			
Nevada	2	1	1	50.0*	
New Hampshire	1		1	100.0	
New York	1780 (approx.)	1507	273	18.0	
Oklahoma	41	39	6	14.6*	4
South Carolina	15	15	2	13.3*	2
South Dakota	1	1			
Tennessee	12	11	1*	8.3	
Vermont	3	2**	1**		
Virginia	46	40	6	13.0	
Wisconsin	244	229	15	6.1	

Note:

In expressing Number Passed, Number Failed, and Percentage of Failures, the Number Repeating Examination has been included in Number Passing.

*Figures not on questionnaire; obtained by computation based on other information.

**This was a "possible outcome." The Board had not met, so no final decision had been made.

***Obtained from a list of Registered Physical Therapists from the Department of Professional and Vocational Standards, Board of Medical Examiners.

who lacked good technic in physical therapy skills and procedures. Only by an oral and practical examination (have) we found students with superior knowledge of theory but who lacked the proper personality to make good clinical therapists.

The following replies in the negative were received to the question of whether or not an oral or practical examination should be given.

1. As only graduates of qualified schools are allowed to take the examination I feel the person must be capable of performing required skills before graduation.
2. Most of our applicants are registered physical therapists who have graduated from approved schools of physical therapy. I, therefore, see no need for a practical examination.
3. (In one of the states it is felt that, due to the small number of active physical therapists in that state, individual ability is soon evident. For this reason they do not wish to bother with an oral or practical examination.)

The final question was: *"On the basis of your experience, do you have any suggestions for im-*

proving testing methods for state examinations of physical therapists?" The following are three of the replies which were received from the states not using the examination provided by Professional Examination Service.

1. We now have more responsibility in the making of the examination, and we are recommending the use of the Professional Examination Service examination. This examination would be used in combination with a practical examination given by registered physical therapists, and an oral examination administered by doctors of medicine.
2. We hope that the Board will some day submit to using the Professional Examination Service examination. "That will take time, however, because of the long standing methods of examining physicians."
3. *a)* "The Professional Examination Service examination would equalize examinations in all states. We are adopting this method for the coming year.
   b) "There should be an interchange of questions among examiners before the examination dates.
   c) "No examining committee could possibly make up a flawless set of questions. Personalities, temperaments, and common sense vary in each of us. The answer is the test pool or the Professional Examination Service examination."

The following replies to this question are from persons in states using the examination provided by the Professional Examination Service.

1. If the same examination were given by all states it would be more fair. This would be particularly true when reciprocity is allowed.
2. If all of the states could use the Professional Examination Service examination, endorsement would be more convenient. This would render a great service to the qualified physical therapist.

Opinion seemed to be overwhelmingly in favor of using the Professional Examination Service examination, even in some of the states which do not now avail themselves of this service. Concern was expressed by members of the physical therapy profession that the examination given for the evaluation of professional competency should be the best possible measuring tool. More widespread use of this examination might facilitate reciprocity among the various states. Dr. Long has emphasized the problems of reciprocity and endorsement:

> An inspection of the annual programs of federations of state boards of one profession after another reveals an inordinate amount of time given over to the discussion of reciprocity and endorsement, or, more properly, the lack of these. The magnitude of this problem seems to increase with the years, and professions with a long history of licensing count it as a blight, and one for which it is difficult to find a remedy.[6]

It should be possible to profit by the experiences of other professional groups in this regard.

It is hoped that the findings of this study will be useful to states initiating legislation and to states with active legislation in making available information relating to examination methods for licensure or registration.

As physical therapy is still young as a profession, there will no doubt be many changes in licensure and examination methods. The best efforts of the members must be continued to assure progress toward mature professional status.

REFERENCES

1. American Physical Therapy Association. Material made available from the files by Dorothy E. Voss, Consultant, Chapter and Membership Department.
2. Brist, F. Manley and Elkins, Earl C.: Some help in the drafting of a physical therapy law. Arch. Phys. M., 39:503-509, (Aug.) 1958.
3. Editorial. Phys. Ther. Rev. 31:194 (May) 1951.
4. Grimm, Elaine R.: Development of an objective examination to license physical therapists: For the use of state boards. Phys. Ther. Rev. 35:556-559 (Oct.) 1955.
5. Kovacs, Richard: Licensure of lay physiotherapists. Physiotherapy Rev. 6-7: 14-16 (Dec. 1926-March 1927).
6. Long, Lillian D.: The physical therapy licensing test: A five year report. Phys. Ther. Rev. 38:679-683 (Oct.) 1958.
7. Robinson, Barbara Oak: The physical therapy profession and the political process. Phys. Ther. Rev. 36:391-398 (June) 1956.
8. Voss, Dorothy E., Correspondence with Dr. Raymond M. McKeown, Chairman, Joint Committee to Study Paramedical Areas in Relation to Medicine, American Medical Association, Coos Bay, Oregon.
9. ————: Personal correspondence, Apr. 27, 1959.
10. Personal communication from Lucile Daniels, member of Committee on Examinations, 1952-1958.

EDITOR'S NOTE: A copy of the thesis (76 pages) is on file in the National Office of the American Physical Therapy Association and is available for loan to Physical Therapy Examining Boards and Committees; the borrowing agency will be required to pay return postage. Information which does not appear in the abstract includes: requirements for filing; administration of the examination, including provisions for retaking the examination in event of failure; authority for scheduling examinations, screening applications, and approving applications; administration or proctoring of examinations, written, oral, and practical; selection and reimbursement of examiners and assistants; time limits for Professional Examination Services' Licensing Test for Physical Therapists; passing grades or scores; oral and practical examinations; and composition of the written examination in states where Boards or Committees assume responsibility for preparation of the written examination.

Report of the 1959 Research Survey

Wilma-Nell Harmony, M.A., and Marian Williams, Ph.D.

The three aspects of a profession, as all of us are aware, are service, teaching, and research. As in the other health fields, the large majority of our group is occupied with treatment of patients. Our professional Association has concerned itself with education of its members for many years, including approval of schools of physical therapy up until 1936 when the American Medical Association was asked to assume this responsibility. Since that time activities of the Association in education have been greatly strengthened, with the establishment of a Section on Education, a Department of Education in the National Office, and sponsorship of an annual institute attended by persons teaching physical therapy students. (In addition, the physical therapy school directors have organized a council which meets twice yearly to consider mutual problems.)

The third aspect of professionalism, research, is just beginning to be recognized as a concern of the Association. Attempts to establish a research group within the Association have met so far with indifferent success, partly because the objectives of such a group have not been clarified. It was suggested in relation to this endeavor that a survey of research activities of all members up to the present time would be useful and informative. By this means persons who may be trained and experienced in research technics could be identified. They could then be called upon as consultants in their area of competence and perhaps asked to contribute to chapter and national programs. Those with like interests could meet to discuss their work and exchange ideas. This plan worked out very well at the Minneapolis Conference last June when a group carrying on electromyographic research participated in the program of the research group and later on met informally throughout the week to discuss their projects and problems.

In January of 1959 a survey questionnaire was distributed to each member of the Association. A preliminary report of returns was made in June at the meeting of the research group. The present report is a final summary of the survey.*

A preliminary questionnaire was drawn up and submitted by mail to 10 members who were known to be or to have been engaged in full or part time research. The returns were then examined in terms of the projects these persons were known to be doing and the auspices under which the work was done. On the basis of these preliminary answers several revisions were made in the survey form. The form was then duplicated and mailed from the National Office to 5,978 members.

It was anticipated that there would be considerable difficulty with the interpretation of the term "research." In an effort to limit returns to planned, well formulated projects, the following definition was adopted for purposes of the investigation: "A project which necessitates collection of data in the solution of a problem." Information requested in relation to the project included the general area of the study (basic science, clinical, educational, other), the nature of the study, and a brief description of the problem and procedure. Additional information requested was concerned with:

1) Over-all organization of the project including the title of the principal investigator, sponsoring or financing agency, and role of the physical therapist in the study
2) Personnel and facilities utilized
3) Duration of the study
4) Publication, completed or contemplated

Those who responded were asked to give their name, title, and address.

Returns

Of the total number of questionnaires sent out to the membership, 210, or 3.5 per cent, were returned. This only approximates the number of individuals and projects involved as some forms mentioned more than one project and some reported studies involving two or more

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* For a more detailed report see Harmony, W.-N., "Research Activities of Physical Therapists," master's thesis, Stanford University, 1960. This may be borrowed through interlibrary loan facilities.

physical therapists. After careful review of the projects reported, 184 were included in the final report. If more stringent criteria of the use of scientific method and research technics were applied to the selection, no doubt a larger number would have been set aside. However, qualitative evaluation of studies described in such brief fashion would be extremely difficult. Furthermore, since the basic aims of the survey were to identify (1) persons in the field with research interests and training, and (2) areas of investigation which are or have been under study, a rather liberal attitude regarding what should be included seemed to be indicated. Accordingly, this report may include projects which the reader does not find compatible with his own interpretation of "research" in the classical sense.

Another consideration should be kept in mind in review of this material. Although an attempt was made to establish the role of the physical therapist, it was not always clear whether he was the principal investigator or a minor assistant. Published material was checked to help clarify this point, and it was assumed that if the physical therapist was the sole or senior author, he or she had played a major role. In many instances projects were done in partial fulfillment of requirements for an academic degree.

The replies received from the survey have been grouped into various categories according to topic. These groups are somewhat arbitrary and may in some instances reflect errors in interpretation of the project as described. Four main areas used for dividing of the reports and the number in each are as follows:

Basic science studies	39	(21.2%)
Clinical investigations	109	(59.2%)
Administrative studies	30	(16.3%)
Educational studies	6	(3.3%)

Many of the projects assigned to the clinical category were similar to basic science studies but involved patients as subjects. Since in the present report space is limited and not all projects can be mentioned, emphasis will be put on work which has been published at the time of the survey and on academic work.

Basic science studies

These have been subdivided into areas of anatomy, including neuroanatomy and functional anatomy (20 studies), and physiology (19 studies). Similar types of studies involving patients or pathologic conditions have been placed in the following section under "clinical investigations."

Anatomy

A number of studies which served as doctoral or M.A. degree problems in anatomy involved gross dissection or histologic technics:

Brief description of study	Role of p.t.; publication
An investigation of variations in the lumbar plexus of man (based on dissection of 48 cadavers)	M.A. thesis, 1958
Study of the pelvic ureter in males and females (involving radiographs of 10 male and 10 female cadavers)	J. Urol., 76: 244-255, 1956 Ph.D. dissertation
Morphology of the sternochondral joints in various mammalian forms (a histological study of 23 species)	J. Morphol., 101: 275-305, 1957 Ph.D. dissertation
Development of the motor trigeminal nucleus and certain closely associated cell groups in human fetuses and correlation to fetal activity	M.A. thesis, 1959

The latter interesting study, which is being continued on an advanced level, related fetal responses following stimulation to stage of development of components of the central nervous system. Approximately 20 specimens were available. A film has been made of this work.

A number of studies dealt with electromyographic recording of voluntary function of normal muscle. Studies listed here were those which were published and/or were pursued as academic degree problems:

Electromyographic investigation of muscles acting on the fingers in the normal hand (recordings from intrinsic and extrinsic muscles during voluntary movements)	J. Appl. Physiol., in press Abstract in Anat. Rec., 127: 2, 1957 Ph.D. dissertation
Electromyographic study of the superficial thigh and hip musculature during voluntary motion (surface electrodes on 11 normal male subjects)	Arch. Phys. M., 32: 508-515, 1951 (p.t. co-author)
Difference in function of upper and lower segments of rectus femoris with regard to separate innervation	M.A. thesis, 1958

Additional electromyographic studies which were reported dealt with hand function, abdominal wall musculature during prescribed exercises, and action of the biceps brachii muscles.

Another series of studies involved measurement of maximum normal muscle forces by means of a force testing device:

Effect of posture on strength of knee flexor and extensor muscles (maximal isometric force of 8 normal female subjects)	J. Appl. Physiol., 11: 475-480, 1957 (p.t. senior author)
Variation in maximal isometric muscle force through the range of joint motion	Phys. Ther. Rev., 39: 145-152, 1959
A comparison of "break" and isometric muscle test values	M.A. thesis, 1953
Determination of isometric joint torque curves of shoulder, hip, and knee	M.A. thesis, 1957

Additional unpublished studies on normal subjects included standardization of grip strength in 600 healthy subjects 4 to 91 years of age; and measurement of force curves of triceps and quadriceps muscles.

Four studies in functional anatomy were:

Observation of the functional activity of the tibialis anterior in man	M.A. thesis, 1956
Function of ligamenta flava in mechanics of the back (involving length-tension studies on specimens from dogs and X ray in vivo)	Am. J. Phys. M., 37:256-258, 1958 M.A. thesis
A device for the application of heavy lumbar traction: its mechanical effects	Arch. Phys. M., 39: 696-700, 1958 (p.t. co-author)
Kinematic investigation of locomotion in normal men (measurement of magnitude and velocity of serial displacements of body segments; data will be used for comparison with abnormal gait patterns)	Team project, 1955-(incomplete) V.A. Hospital

Physiology

Several problems dealt with technics for development of muscle strength:

Differences in Oxford and DeLorme technics for weight lifting	Arch. Phys. M., 35: 420-426, 1954 (p.t. not listed as author in this report)
To determine whether DeLorme type exercise is significantly superior to conventional types in use for development of muscle strength	M.S. thesis, 1948
To determine whether speed of performance of exercise makes any significant difference in the development of power, and whether the magnitude of work performed per exercise period and per unit of time may be of significance	Arch. Phys. M., 36:495-502, 1955 (p.t. co-author) M.S. thesis
Evaluation of brief maximal exercise procedures as a means of developing and maintaining muscle strength	Ph.D. dissertation, 1958-

Studies related to means of delaying muscle atrophy included effects of massage or electrical stimulation on muscle, and on circulation of blood and lymph:

Effects of massage on delaying atrophy of denervated skeletal muscle of the dog	Phys. Ther. Rev., 28: 284-285, 1948 (p.t. senior author)
Is electrical muscle stimulation an effective means for reduction of girth?	Phys. Ther. Rev., 39:92-94, 1959
Effects of electrical stimulation upon atrophy of partially denervated skeletal muscles of the rat	Am. J. Physiol., 154:451-454, 1948 (p.t. co-author)

Prevention of peripheral stasis by electrical stimulation of the leg muscles (bilateral stimulation of both calves using intermittent stimulator)	Am. J. M. Sc., 216: 403-406, 1948, (p.t. not listed as author in this report) M.S. thesis
Effect of massage, passive motion, and electrical stimulation on the lymph flow in the foreleg of the dog (based on dye injections in paw of 17 anesthetized dogs)	Arch. Phys. M., 33: 604-612, 1952 (p.t. senior author) M.S. thesis

Three studies of neuromuscular mechanisms were the following:

Responses of human adductor pollicis to indirect paired stimuli (quantitative evaluation of peripheral neuromuscular mechanism in elderly female subjects, including electromyographic analysis)	Fed. Proc., 15:663, 1956 (p.t. co-author)
Investigation of possibility of individual skeletal muscle fiber innervation from different segments of the spinal cord (muscle tension recordings in frog and rat during stimulation of lumbar roots)	M.S. thesis, 1956
Effects of hot packs on cutaneous and motor nerve irritability	M.A. thesis, 1948

The remaining studies in this series involved effects of various testing and therapeutic procedures on physiological responses and measurement of metabolic processes in normal persons. Heating modalities, ultrasound, and exercises were included. Published studies and M.A. degree thesis topics were as follows:

Study of cause of discrepancies due to passage of current through the tissues; designed to develop a quantitative clinical method for the measurement of muscle excitation from the high-frequency part of the frequency-intensity curve	M.S. thesis, 1951 "Various publications" relating to continuing study; p.t. co-author
Relationship between physical fitness and metabolic cost of muscular endurance exercises as measured by repetitive selected muscle actions performed under submaximal work conditions	M.A. thesis, 1958
Efficiency of human movement (evaluation of motor activity with indirect calorimetry)	Mimeographed reports to National Institute of Health (on-going study; p.t. acted as research assistant)
Effects of short wave diathermy on blood flow in the forearm (venous occlusion plethysmographic method applied to 13 normal healthy adult subjects)	Arch. Phys. M., 38:369-376, 1957 (p. t. listed as technical assistant)
Effects of infrared irradiation on skeletal muscle of the rat (measurement of H_2O and chloride shifts before and after irradiation)	M.A. thesis, 1950
Effects of local heat, exercise, diathermy, ultrasound on O_2 uptake, blood flow, tissue temperature	J. Clin. Invest.; paper on anaerobic exercise in press (p.t. acted as research assistant)
Measurement of pain threshold after therapeutic application of ultrasound, microwaves and infrared (based on analgesic effect in area of ulnar nerve distribution, using five series of 10 volunteer subjects)	Arch. Phys. M., 39:560-565, 1958 (p.t. co-author)

Of the foregoing series of studies, approximately half were in the field of anatomy, including neuroanatomy and functional anatomy. In this group eight M.A. and three Ph.D. programs in departments of anatomy were represented. Seven publications were reported in five journals, with the physical therapist listed as senior author in one and as co-author in two. Of the 19 studies placed under "physiology" there were three M.A. and seven M.S. degrees represented, and one Ph.D. program. Eleven publications appeared in more than five journals (one on-going study appeared in several papers). In five the physical therapist was listed as co-author, in two as senior author, in two his name did not appear in the report cited, and in one credit was given for technical assistance. The remaining study was reported by two physical therapists.

Funds for research were available from a variety of sources. A number of those on academic programs had received National Foundation teaching fellowships.

Clinical studies

Reports in this division have been grouped according to various factors such as pathology, areas of medical specialty, or testing tools used. A number of studies closely paralleling those reported under "basic science" but utilizing patients will be mentioned first. Electromyographic studies were made of normal and pathologic muscles of the lower extremities (e.g., J. Bone Surg. Am. Vol., 41A:123-131, 1959); in kinesiologic investigation of abdominal wall muscles of polio patients; to determine muscular participation in the Babinski reflex; and to test during surgery for the presence or absence of clinically unrecognized muscular denervation in the paraspinal musculature of "idiopathic" scoliotic patients. An extensive study still in progress concerns the relationship between the activity of the respiratory muscles (as determined by the electromyograph), amplitude of chest expansion, and pulmonary ventilation and air flow in normal subjects and in those with respiratory paralysis.

Dynamometric measurements have been made of comparative strength of neck flexor muscles in 47 normal and 53 postpolio children (Arch. Phys. M., 39:572-576, 1958; p.t. senior author). Force tests of knee extension were made following patellectomy (Phys. Ther. Rev., 32:401-404, 1952); and of the triceps surae before and following surgical release (1957-).

A number of reports involved measurement of cardiovascular and/or respiratory function:

Determination of heat effects of moisture	Proc. 2nd Internat. Cong. Phys. Med., Copenhagen, 1956
Oscillometric, thermometric, plethysmographic recordings of cases of peripheral vascular disease and normal subjects	1957– (Team project)
Blood pressure, pulse rate, electrocardiogram, and heart sound response to: standing bed activities, sitting tolerance, and measured standardized muscle work-loading in normal and polio patients	(Team project)
Effect of 3 minute stimulative Scotch douche on blood pressure and pulse of psychiatric patients	Information Bull. of V.A. Dept of Med. and Surg., IB:10-58, 1954

A current study was concerned with energy expenditure of hemiplegic patients as compared with normal subjects (1957- ; p.t. research assistant). Published studies relating to respiration were the following: "Effects of hydrotherapy (Hubbard tank) on physiological functions of respiratory poliomyelitis patients" (Phys. Ther. Rev., 33:581-586, 1953; p.t. senior author), and "Effect of intermittent positive pressure breathing on postoperative pulmonary function of thoracic surgery patients (Dis. Chest, 30:168-171, 1956; p.t. senior author). Additional studies related respiration and exercise:

Effect of breathing exercises on the relationship between intrathoracic pressure and volume flow in emphysema patients	1959– (proposed thesis)
Effect of selected exercises on vital capacity of polio patients compared with normal subjects	M.A. thesis, 1952
Effect of posture on the respiration of polio subjects	M.A. thesis, 1952
Possible correlation between clinical breathing patterns and thoracoabdominal expansion of postpoliomyelitis respiratory patients	M.A. thesis, 1951

Other on-going studies were related to pursed-lip exhalation in emphysema (1959-), the effect of breathing and postural exercise on patients with cystic fibrosis, and studies of pulmonary function in breathing exercises for patients over 50 years of age.

A variety of studies dealt with disabilities of muscles, bones, and joints. For example, "effect of cold application on joint motion limited by pain, and comparison of cold with combined cold and exercise"; heat versus cold in acute orthopedic problems; and incidence of hypersensitive areas in posterior shoulder muscles (Am. J. Phys. M., 34:585-590, 1955; p.t. co-author). "Influence of exercise on nitrogen metabolism following femoral fracture in young adult males" was the subject of a master's thesis in physical therapy, 1952. A study of postsurgical patellectomy patients required manual muscle testing by the physical therapist (Am. Surgeon, 24:273-279, 1958; p.t. not listed as author). A study is in progress on functional performance of the trunk following interscapular and/or abdominal fascial straps. Two studies on scoliosis were: "Method of attempting to prevent increasing paralytic spinal curvature in the growing child" (Arch. Phys. M., 39:241-244; 1958; p.t. not listed as author); and use of "muscle

strength estimates, balance studies, body measurements in evaluation of the progress, regression or arrest of scoliosis and estimation of the effects of surgical procedures."

Topics of investigations in poliomyelitis not mentioned elsewhere included the frequency of paralysis in various muscles (Phys. Ther. Rev., 30:131-134, 1950; p.t. co-author); 100 muscle tests on patients with useful hands but with thenar eminence paresis or paralysis (half had functional apposition and half did not). Another current study was:

The character of serial muscle strength estimates with reference to the pattern of muscle strength involvement and recovery in 120 acute poliomyelitis admissions examined for an average of seven times each over a period of 18 months and a final test four years after onset (incomplete)

Several persons reported participating in the nationwide gamma globulin field trials of 1951-53 (Phys. Ther. Rev., 33:337-345, 1953) and subsequent Salk vaccine evaluation studies, (1954-). A study of three population groups was undertaken to determine whether "subclinical poliomyelitis infections may cause detectable residual muscle weakness in a fraction of those individuals with unrecognized infections" (Pediatrics, 21:771-780, 1958; p.t. co-author).

Evaluation of exercise procedures included studies on postpoliomyelitis patients, utilizing chronaxie, electromyograph, and manual and functional tests; isometric and isotonic progressive resistive exercises to the lower extremity groups in geriatrics (1958-); abdominal exercise and pneumoperitoneum in the treatment of tuberculosis (Phys. Ther. Rev., 34:567-570, 1954; p.t. senior author); effect of exercise on physical fitness of tuberculosis patients, involving a control group of patients (1958-); comparison of two types of resistance exercises following meniscectomy (Phys. Ther. Rev., 39:85-88, 1959); and use of overload in modified progressive resistive exercises, based on 13 cases with prolonged quadriceps insufficiency (Phys. Ther. Rev., 38:825-826, 1958). Kraus Weber tests were given to school children in one city to assess effectiveness of the exercise program used in the schools.

In relation to braces, ortheses and prostheses, studies were reported on functional arm bracing (J. Bone Surg. Am. Vol., 38A:477-499, 841-856, 1956; p.t. not mentioned as author); and development of an arm sling to prevent shoulder subluxation (Phys. Ther. Rev., 39:479-481, 1959). On-going work included development of a pneumatic upper limb prosthesis (1959-); effect of bracing on foot mechanics, for which a technic for studying weight-bearing forces inside the shoe during gait is being developed; and an experimental approach to the correction of congenital clubfoot involving control of the withdrawal reflex (1955-). Two physical therapists reported participation in the testing program at the Prosthetic Research Laboratory of New York University. "The effect of a program of instruction on the gait of unilateral above-knee amputees" was the subject of a doctoral problem in education based on work at the Laboratory.

Studies involving the nervous system were varied. Regeneration of postsurgical peripheral nerve lesions was studied on volunteer veteran patients by means of several types of sensory and motor tests (1947-1952). Neurological aspects of spinal cord injuries were investigated by various means (Arch. Phys. M., 29:579-582, 1948; p.t. not listed as author). Three studies investigated use of neurophysiological mechanisms in facilitation of movement. Tonic neck and labyrinthine reflexes were found to facilitate work output of elbow muscles in the case of 3 cerebral palsy patients (Phys. Ther. Rev., 33:237-241, 1953; M.S. thesis). An exercise program based on neuromuscular facilitation technics was given to 206 brain injured and the results evaluated (Phys. Ther. Rev., 36:664-675, 1956). A third report was based on 1 patient who was treated by conventional technics and subsequently by "reinforcement" procedures.

Study of hemiplegic patients was the subject of the following: gait analysis of 11 patients (Q. Rev. Pediat., 7:15-24, 1952; p.t. acknowledged); investigation of intensive use of sinusoidal current in return of active motion of upper extremities (1957-); and status of elderly patients with hip fracture. Effect of chemopallidectomy on patients in Parkinson's disease was determined by manual and functional tests. Progress records were reviewed to determine the amount and rate of recovery of muscle function in 79 patients with traumatic paraplegia (Phys. Ther. Rev., 35:299-305, 1955; p.t. co-author).

Neuromuscular tension was the subject of two reports:

To determine causes of neuromuscular tension which are discoverable for every subject or patient (case studies)	Doctoral dissertation, 1936 Department of Education
To determine an effective method of reducing neuromuscular hypertension (utilizing electromyographic recording)	Master's thesis, 1958

Two studies dealing specifically with spasticity were: "characteristics of the spastic hand at rest and in activity; investigation of means to improve function" (1958–); and the value of combined current (AC-DC) therapy for management of spasticity and spasm (Arch. Phys. M., 35:427-436, 1954; p.t. not listed as author). Research involving drug therapy in the treatment of neuromuscular diseases included the following:

An attempt to find a drug to relieve muscular spasm (physical therapist gave functional tests)	Legislative document, NYC, No. 44, 1954 (Filed in the City courthouse)
To determine if Robaxin will enable muscles to relax to obtain better mobility of the extremities (double blind study with medication and placebo)	1958–
To determine whether Equinil (meprobamate) will aid in the treatment of cerebral palsy in the low I.Q. group	1958

Additional studies dealing with cerebral palsy patients were the following: developmental sequence of motor control in cerebral palsy, based on analysis of ability of 100 children between the ages of 4 and 16 years to control basic postures and improvements preliminary to walking (Phys. Ther. Rev., 38:749-755, 1958; M.A. thesis); sensory status of lower extremities utilizing esthesiometer and electronic device to measure tone; and effect of walker on gait and development of spastic cerebral palsied as compared with more conventional methods of gait training. Further reports dealt with psychological aspects such as motivation of cerebral palsy patients and color preference. Also reported were studies on olfactory sensitivity and gustatory discrimination.

A large number of investigations were related to clinical testing procedures. Examples are: standardization of a profile of muscle strength estimation and activity; development of a practical and reproducible endurance test technic; a "reliable measure of spasticity," based on degree of resistance to passive motion; and accuracy of goniometry in hip flexion as checked by X-ray films. A series of articles on goniometry covered review of literature, technics, and reliability tests (Phys. Ther. Rev., 29:195, 256, 302, 1949). Published studies were the following:

Survey of testing methods and forms used in 43 rehabilitation centers for evaluating activities of daily living	Phys. Ther. Rev., 36:460-466, 1956
Use of springs in objective evaluation of muscle strength	Phys. Ther. Rev., 32:624-627, 1952
Variations in technic of current manual muscle testing	Phys. Ther. Rev., 39:466-475, 1959 M.A. thesis
Development and use of clinical electromyography (related to electrical testing, skin resistance, skin temperature, sweating, oscillometric findings)	Arch. Phys. M., 32:320-324, 1951 (acknowledged aid of physical therapists)
Clinical evaluation and review of complications of cobalt chloride sweating test	Arch. Phys. M., 34:156-161, 1954 (p.t. co-author)

Physical therapists participated in studies designed to explore the clinical value of ultrasound. One member reported five studies published in various journals between 1951 and 1957 on such topics as the effectiveness of ultrasound in the treatment of osteoarthritis in elderly patients, of subdeltoid bursitis, in geriatrics, and in the field of veterinary medicine. Other reports listed recording of temperature changes in human tissues to a depth of 3 cm. following ultrasound application in normal and poliomyelitis subjects (M.S. thesis); therapy for plantar warts (1957–); and ultrasound in the treatment of chronic arachnoiditis (1959–). A placebo-controlled study on ultrasound in periarthritis of the shoulder was reported in the Am. J. Phys. M., 33:31-35, 1954 (p.t. co-author). In addition to the above, a study to determine whether ultrasound could be used in the presence of surgical metal implants was reported in Arch. Phys. M., 39:692-695, 1958 (p.t. co-author) and the Phys. Ther. Rev., 38:823-824, 1958 (p.t. senior author).

Several studies were reported in the field of exercises for obstetrical patients. These were concerned with pre- and postpartum abdominal muscle strength, positioning during delivery, relationship of type of breathing to course of labor, and the relationship of sleeping positions of the

infant to alinement of feet and legs. Publications have appeared in the Phys. Ther. Rev., (e.g. 21: 239-245, 1941) and related reports by physicians in a number of medical journals.

Various additional studies were reported. One traced the development of present-day massage technics from basic massage "systems" (Phys. Ther. Rev., 35:560-566, 1955; M.A. thesis). Relationship between the cessation of symptoms of so-called "whiplash" injuries and financial settlement was being studied (1958–). Another topic was the degree to which a counseling approach to patients is used by physical therapists in the treatment situation (Ed.M. thesis).

Administration and physical therapy services.

Thirty studies were placed in this category. Some were related to personnel policies, salaries and operating costs, and use of physical therapy aides. Others dealt with treatment programs, facilities, and evaluation of patient progress.

Several concerned employment situations in physical therapy. The following, based on surveys, were carried out as master's program projects or theses:

Factors influencing supply and demand of physical therapists in Georgia and South Carolina (questionnaire survey of employers and physical therapists)	1958– (incomplete)
Occupational opportunities for physical therapists on a statewide basis (project for course in Occupational Guidance)	1953
How can retired Army physical therapists best employ themselves after retirement? (report for Vocational Counseling program)	1958
Development of a salary scale for physical therapists in voluntary general hospitals in New York City	1958–

A related survey carried out in 1958 investigated salary ranges and duties of physical therapy aides in Arkansas.

A second group of reports dealt with current and follow-up studies of patients. These were approached in a number of ways. Fifty poliomyelitis patients were surveyed to determine whether they continued to improve after so-called "maximum rehabilitation" (Phys. Ther. Rev., 33:351-358, 1953). One hundred twenty cerebral palsy patients in Vermont were observed and interviewed in their homes so that their physical, psychological, social and vocational adjustment could be assessed (1957). A third survey reviewed the status of children who had passed through an orthopedic clinic during the past 10 school years (1958). The status of 300 patients receiving treatment in a rehabilitation center in the two year period 1955-56 was reported. Status of current patients was also the subject of the following:

Functional abilities of 250 poliomyelitis patients over a period of 4 years who received rehabilitation services	1954
Medical, social, psychological, and vocational needs of 611 patients at a city and county hospital	1955

Several reports concerned the services of "rehabilitation" personnel and integration of these services. One such study evaluated vocational rehabilitation in a home care program (1956–58) and another the function of the public health nurse in treatment of the homebound (1956–). An interesting project utilizing a control group explored "rehabilitation achievement" of patients treated in industrial medical departments and in a rehabilitation center (1957–).

Administration of rehabilitation centers was the subject of a number of investigations. For example:

Operating costs and income of rehabilitation centers in relation to program (a 2-3 year study of 10 to 12 centers)	1957–
Amount spent by public and private agencies for support and rehabilitation of 17 patients treated at a rehabilitation center compared to actual and projected return made by these patients to society	1956
Study of equipment in rehabilitation facilities	1957, pamphlet

Several projects concerning rehabilitation programs and services were supported by public and private agencies, e.g., U.S. Public Health Service, Office of Vocational Rehabilitation, National Society for Crippled Children and Adults, The National Foundation, Arthritis and Rheumatism Foundation, and the United Cerebral Palsy Association.

Among the studies which dealt with treatment programs and facilities in public and private schools and state programs were:

Physical therapy in state crippled children's programs	Phys. Ther. Rev., 30:273-276, 1950 M.A. thesis
Evaluation of nursery school experience for the child with cerebral palsy	Cerebral Palsy Rev., 17:102-104, 1956 (p.t. senior author)
Evaluation of the physical education programs for physically handicapped children in the Los Angeles City Schools	Res. Q., 16:216-220, 1945 M.A. thesis
Physical therapy services in special schools and classes in the United States	Doctoral dissertation (current) Department of Education

Surveys covering broad geographical areas were mentioned by three therapists who had received travelship assistance from The National Foundation. They studied care of the cerebral palsied in selected countries of Europe, geriatric care in Western European countries, and use of physical therapy aides in the United States.

Education

Six projects were reported in this area. One dealt with current teaching practices in the approved schools for physical therapy, two with recruitment of students, and one with curriculum content of physical therapy programs. Two annotated bibliographies of literature in the field of physical therapy were reported.

The survey of current practices included 36 physical therapy teaching programs. This was inaugurated in 1958 and the findings reported to school directors. The North Central Region Section of the Council of Physical Therapy School Directors initiated a study in 1953 of effective recruiting measures which was based on a survey of entering students in schools of physical therapy in this region. This study was later extended to cover a 10 year period and is expected to continue until 1966. A second recruitment study was undertaken as an M.A. thesis problem last year. Opinions and comments from students in all current schools were obtained and a report of findings was made to the schools.

The curriculum study mentioned above was initiated in 1941 and included the 16 schools of physical therapy which were approved at that time. Survey forms were prepared with the assistance of the American Physiotherapy Association and sent out by the Council on Medical Education and Hospitals of the A.M.A. Compilation and analysis of this material was undertaken as an M.A. degree thesis study.

The annotated bibliographies were concerned with literature on hemiplegia and on "research in physical therapy education."

CONCLUSION

The foregoing reports do not represent a complete record of research activities of members. A number of studies known to the authors did not find their way back to be included with this material. However, this record does provide a good picture of the scope and types of studies undertaken, and it marks a first step toward taking stock of our resources of personnel in this aspect of the field.

It is evident from the present survey that physical therapists have taken a variety of roles in many types of research activity. Some have become members of a research team and have learned technics by an apprentice method. Others have sought training through formalized academic programs and obtained their apprenticeship in this way. As might be expected, the number of members interested in research is very small as yet. It will grow as we become more alert to the needs for recognition and support of research activity and nurture to best advantage the small beginnings which have been made.

How to Arrange to Borrow a Print of *The Return*

A complete listing of the film libraries where the Association's latest film is on deposit may be found on page 99 ff. of the February, 1959, issue of the *Physical Therapy Review*. If the film library nearest you cannot supply you on the date you need *The Return*, look through the list to see if another library will service your state. National Office will send you a print if it is unavailable locally. In addition to the 38-minute version, there is a TV version running 28 minutes. There is also a 58-second TV spot with sound track, excerpted from *The Return*. Both of these are available for borrowing from the National Office. *The Return* was chosen by Howard Thompson of *The New York Times* as one of the 10 best nontheatrical films of 1958.

Communication with Non-English Speaking Patients:

II. Danish, Norwegian, Swedish

EDITOR'S NOTE: The translations of useful expressions in French, Italian, and Spanish which appeared in the September, 1959, issue of the *Review* were favorably received by the Executive Committee of the World Confederation for Physical Therapy, members of our Association, and others, including occupational therapists.

In this issue the "useful expressions" are presented in Danish, Norwegian, and Swedish. Hanne Thorsen of Copenhagen, a Danish physical therapist and member of Danske Fysioterapeuter; Karen Hansteen, Head Physical Therapist, and Ruth Ellingsen, Assistant Head Physical Therapist, Sophies Minde Orthopaedic Hospital, Oslo, members of Norske Fysioterapeuters Forbund; and Ann-Mari Hamilton of Stockholm, Chairman of Legitimerade Sjukgymnasters Riksforbund, have contributed the translations in their respective native languages.

A forthcoming issue will include another series in the Dutch-Flemish, Finnish, and German languages contributed by physical therapists from the member organizations of the World Confederation for Physical Therapy in the Netherlands, Finland, and Western Germany.

ENGLISH	DANISH	NORWEGIAN	SWEDISH
I. *General Expressions*			
1. You are not going to fall	De falder ikke	Du kommer ikke til å falle	Ni kommer ej att falla
2. Don't be afraid	Vær ikke bange	Vær ikke redd	Var inte rädd
3. That doesn't hurt you	Det gør ikke ondt	Det gjør ike vondt	Det här gör inte ont
4. Don't cry	Græd ikke	Ikke gråt	Gråt inte
5. Don't worry	Vær ikke ængstelig	Vær ikke engstelig	Var inte orolig
6. Sit up	Sæt Dem op	Sitt opp	Sitt upp
7. Stand up	Op at stå	Reis opp	Stå upp
8. Walk	Gå	Gå	Gå
9. Roll over	Vend Dem om	Rull over	Vänd er om
10. Lie on your face on the table	Læg Dem på maven på plinten	Ligg på maven på bordet	Ligg på magen på bordet
11. Lie on your back on the table	Læg Dem på ryggen på plinten	Ligg på ryggen på bordet	Ligg på ryggen på bordet
12. Lie on your side	Læg Dem på siden	Ligg på siden	Ligg på sidan
13. Lie on your other side	Læg Dem på den anden side	Ligg på den andre siden	Ligg på andra sidan
14. This way	Sådan	Slik	Så här
15. Again	En gang til	Igjen	Om igen
16. Hold it	Hold stillingen	Hold der	Håll kvar
17. With force	Brug kræfterne	Med kraft (mot motstand)	Kraftigt
18. Push down with your hands to lift your body	Pres hænderne nedad og løft kroppen	Skyv fra med hendene og løft kroppen	Stöd på armarna och lyft upp kroppen
19. Slowly	Langsomt	Langsomt	Långsamt
20. Not so fast	Ikke så hurtigt	Ikke så fort	Icke för fort
21. Rest	Hvil	Hvil	Vila
II. *Anatomical Names*			
1. Neck	Hals	Halsen	Halsen
2. Abdomen	Mave	Abdomen	Magen
3. Chest	Bryst	Brystet	Bröstet
4. Back	Ryg	Ryggen	Ryggen
5. Spine	Rygrad	Ryggraden	Ryggraden
6. Face	Ansigt	Ansiktet	Ansiktet

	ENGLISH	DANISH	NORWEGIAN	SWEDISH
7.	Thumb	Tommelfinger	Tommelen	Tummen
8.	Buttocks	Halen	Setet	"Skinkorna" glutéerna
9.	Knee	Knæ	Kneet	Knä
10.	Heel	Hæl	Helen	Häl
11.	Shoulder	Skulder	Skulderen	Skuldror
12.	Arm	Arm	Armen	Arm
13.	Elbow	Albue	Albuen	Armbåde
14.	Wrist	Håndled	Håndleddet	Handled
15.	Hand	Hånd	Hånden	Hand
16.	Fingers	Fingre	Fingrene	Fingrar
17.	Hip	Hofte	Hoften	Höften
18.	Leg	Ben	Benet	Ben
19.	Foot	Fod	Foten	Fot
20.	Toes	Tær	Tærne	Tår
III.	*Face and Neck*			
1.	Lift your head	Løft hovedet	Løft hodet	Lyft upp huvudet
2.	Open your mouth	Åben munden	Åpne munnen	Öppna munnen
3.	Close your mouth	Luk munden	Lukk munnen	Slut munnen
4.	Open your eyes	Åben øjnene	Åpne øynene	Öppna ögonen
5.	Close your eyes	Luk øjnene	Lukk øynene	Slut ögonen
6.	Wrinkle your nose	Rynk næsen	Rynk på nesen	Rynka på näsan
7.	Smile	Smil	Smil	Skratta
IV.	*Upper Extremity*			
1.	Raise your arm	Løft armen	Løft armen	Lyft armen
2.	Move your arm out to the side	Før armen ud og op	Før armen ut til siden	Lyft armen utåt
3.	Move your arm back to the side	Før armen ned igen	Før armen ned til siden igjen	Sänk armen till sidan
4.	Bend your elbow	Bøj albuen	Bøy albuen	Böj armbåden
5.	Straighten your elbow	Stræk albuen	Strekk albuen	Sträck armbågen
6.	Turn your hand over	Drej hånden	Snu hånden	Vrid handen
7.	Bend your fingers	Bøj fingrene	Bøy fingrene	Böj fingrarna
8.	Straighten your fingers	Stræk fingrene	Strekk fingrene	Sträck på fingrarna
9.	Bend your wrist	Bøj hånden nedad	Bøy håndleddet	Böj handen nedåt (flexion)
10.	Lift your hand	Løft hånden opad	Løft hånden	Lyft handen uppåt (extension)
11.	Pull your shoulders together	Træk skuldrene sammen	Trekk skuldrene sammen	Dra ihop skuldrorna
12.	Lift your shoulder	Løft skuldrene	Hev skulderen	Höj axlarna
V.	*Lower Extremity*			
1.	Bend your hip	Bøj i hoften	Bøy hoften	Böj upp benet
2.	Lift your leg	Løft benet	Løft benet	Lyft upp benet
3.	Bend your knee	Bøj knæet	Bøy kneet	Böj knät
4.	Straighten your knee	Stræk knæet	Strekk kneet	Sträck knät
5.	Roll your leg in	Drej benet indad	Drei benet inn	Vrid benet inåt
6.	Roll your leg out	Drej benet udad	Drei benet ut	Vrid benet utåt
7.	Lift your foot	Bøj foden opad	Løft foten	Böj upp foten
8.	Push your foot down	Pres foden nedad	Skyv foten ned	Sträk foten nedåt
9.	Lift your toes	Bøj tæerne opad	Løft tærne	Böj upp tårna
10.	Bend your toes	Bøj tæerne nedad	Bøy tærne	Böj ned tårna
11.	Pull your foot in	Drej foden indad	Trekk foten inn	Vrid foten inåt
12.	Pull your foot out	Drej foden udad	Trekk foten ut	Vrid foten utåt

UNICEF Helps Rehabilitate Physically Handicapped Children in Ten Countries

Eight months ago a paralytic disease of unknown origin suddenly broke out in the Moroccan town of Meknes and the surrounding areas, causing paralysis to some 200-300 persons a day. By the time the cause had been established by the World Health Organization neurologists, and drastic governmental measures had been taken to prevent further spread of the disease, the total number of victims had reached about 10,000 of whom more than half were children and adolescents.

The cause was found to be poisoning by orthocresyl-phosphate, a compound present in a lubricant used by United States Air Force planes. Some Moroccan merchants had used the lubricant to dilute olive oil used for cooking.

Because of the complete lack of trained physical therapists in the country and the immediate need for therapeutic equipment, the Moroccan government applied to the United Nations Children's Fund, UNICEF, the World Health Organization, The League of Red Cross Societies, and other international organizations for assistance.

On receiving the technical approval of WHO, UNICEF allocated $42,000 for the provision of ward equipment (wheel chairs, autoclaves, and treatment tables) to two emergency hospitals at Meknes and Kenitra. The equipment, weighing about 17 tons, was shipped to Morocco last February.

In addition to emergency situations like the Moroccan one, UNICEF has adopted, ever since its inception, a policy of aiding governments to establish or strengthen programs for the treatment and rehabilitation of physically handicapped children by providing essential equipment and supplies. The aid is given primarily to model and pilot centers for demonstration and training in modern rehabilitation technics. These centers provide the nuclei for the development of national rehabilitation programs.

Currently there are 10 countries receiving UNICEF aid in their projects for the rehabilitation of handicapped children. These are: Greece, India, Indonesia, Japan, Pakistan, Poland, Spain, Thailand, and Yugoslavia.

Among the rehabilitation programs presently being conducted with aid from UNICEF is a project in Greece. This country has received a UNICEF allocation of $76,100 to provide supplies and equipment for three hospitals, two children's clinics, and the National Rehabilitation Center for Physically Handicapped Children at Voula which serves as a national training and demonstration center. This center is equipped to handle 300 children. Equipment for an orthopedic workshop at Voula was also provided by the Fund. The Orthopedic Surgery Hospital at Pendeli which was opened in 1957 with 240 beds was also provided with equipment by UNICEF. With UNICEF and World Health Organization assistance, a school of physical therapy was opened and held its first courses in 1957-58. A major step in the direction of developing a national program for care of handicapped children was taken by the Greek government itself when it set up the National Rehabilitation Board.

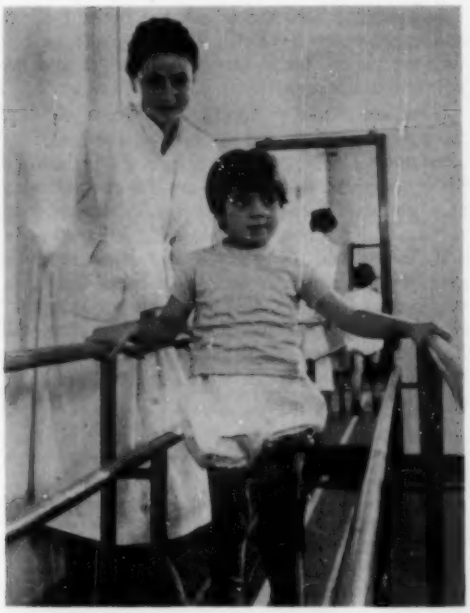
Japan which has very advanced services for the rehabilitation of handicapped children, received from UNICEF, under an allocation of $77,800, equipment for its National Center in Tokyo, which gives guidance and advice to the provinces in the rehabilitation of handicapped children. UNICEF has also provided equipment for 48 prefectural hospitals patterned on the national center.

India, through a small UNICEF allocation, has received equipment for a workshop for the manufacture of prosthetic appliances in the Bombay Center for the treatment and rehabilitation of physically handicapped children. The center is being upgraded as a national institution to train personnel for such services throughout India.

Thanks to the efforts of the Indonesian Institute for the care of crippled children a phenomenal change in the attitude toward the handicapped has taken place in that country during the last decade. The traditional feeling of shame that once made Indonesian parents hide their crippled children is dying out rapidly. UNICEF has allocated $30,000 for equipment for the five centers that were established to treat Indonesian handicapped children. It has also provided teaching aids for two major centers training assistant physical therapists who after finishing their training serve in the smaller centers.

Four years ago UNICEF allocated $45,500 to Spain to provide physical, occupational, and speech therapy equipment for a national program for the rehabilitation of handicapped children. UNICEF help went to seven demonstration and training centers (four in Madrid, one each in Barcelona, Santander and Valencia). The "rehabilitation teams" which were trained in these

Prepared for the *Physical Therapy Review* by United Nations Children's Fund, Public Information Service.



Maria, a victim of polio, takes her first tentative steps after three months of physical therapy at a rehabilitation center near Athens.

centers included medical, social, educational, and vocational personnel. The United Nations and the World Health Organization are providing experts and fellowships in physical and occupational therapy. UNICEF-provided equipment has been installed at the Clinica de la Concepción which is Madrid's principal training center, and at the Provincial and Niño Jesus hospitals in Madrid.

Although prior to 1951 UNICEF had given aid on a rather small scale to Yugoslav orthopedic clinics of the children's hospitals at Belgrade, Ljubljana, and Zagreb and to schools for the blind and deaf at Zagreb and Zemun, it was in 1957 that UNICEF substantially increased its aid for the rehabilitation of handicapped Yugoslav children. For a coordinated national program, more than $100,000 was approved for the strengthening of six institutions to train physical therapists, vocational counselors, and specialized teachers for the rehabilitation of children with orthopedic or sensorial handicaps. UNICEF has provided equipment for physical therapy, for diagnosis and testing, for training of the blind, for audiological therapy, and for vocational training.

A course specializing in physical medicine and rehabilitation has been introduced at three universities in Yugoslavia. A Federal Rehabilitation Board has been established comprising representatives of all the rehabilitation centers. The Belgrade Center has become the Federal Rehabilitation Institute where first-rate research work is being carried out in the methods of rehabilitation of children with hearing and speech defects.

Early in 1956 the new Lebanese national rehabilitation center was inaugurated at Hazemieh near Beirut. This is the first center of its kind in the Arab countries, and is now serving as a model demonstration and training center for the care of handicapped children of many of the Eastern Mediterranean countries. Physical therapy and hydrotherapy are provided. There is also a department for occupational therapy and a prosthetics workshop. This project was started with assistance from the Lebanese Union for Child Care, the American University of Beirut, and the French Faculty of Medicine.

Because rehabilitation programs are relatively costly in relation to the number of children helped, they have a somewhat lower priority in UNICEF'S aid programs, as compared for instance to maternal and child welfare services and eradication of mass diseases.

A 6 year old polio patient at the Tokyo rehabilitation hospital.

UNICEF is not satisfied merely to help governments meet immediate needs of children. It chooses to help projects which provide a sound basis for comprehensive and continuous services to improve child health and welfare.

In contrast to the limited aid given by UNICEF to projects for rehabilitation of physically handicapped children, UNICEF aid in general helped last year in one way or another some 55 million children and mothers in 104 different countries and territories. The Fund has given equipment and supplies to more than 7,000 rural health centers and 15,000 village subcenters. In 1959 UNICEF aid allocations totaled $24 million which were matched by the recipient governments by some $60 million to be spent on the same projects. However, considering the enormity of the task of helping the children in the underdeveloped areas of the world, the present effort and expenditure have still a long way to go before the vicious circle of disease, hunger and ignorance is broken.

This sad situation admittedly is ages old but the way to overcome it is new and the desire to overcome it is for the first time in mankind's history, universal. Considering the present pace and intensity of effort, public health experts fear it may take many a generation to defeat hunger and disease and, in the course of it all, many a generation might have to be sacrificed—unless a short cut is found for this salvaging process. One short cut is to double the effort, on both national and international levels, by the more fortunate peoples who can afford greater efforts in this direction.

Case Reports

Approach to Rehabilitation of the Rheumatoid Arthritic Patient

Betty Brown, B.S.

Amidst all the recent interest in therapeutic technics of muscle strengthening and mobilization currently used in various treatment centers, it seems wise at this time to present a case that illustrates the value and efficacy of time-tested basic standard technics. Performance of coordinated active-assistive exercises, progressing to active exercises and, finally, gradually increasing resistive exercises have given good results in the past and still give good results if they are administered by a well trained, interested, and patient physical therapist.

A 13 year old girl developed rheumatoid arthritis in 1957, with pain and swelling in feet, ankles, knees, hands, and elbows. For the year prior to admission she had been in elementary school as a private boarding student. She came here directly from school and was admitted to the Georgia Warm Springs Foundation on June 8, 1959.

Examination on admission revealed deformities as follows: flexion contractures at elbows and knees, valgus feet—particularly on right, hallux valgus bilaterally, and limitation of motion in wrists and fingers bilaterally. There was marked muscular weakness throughout her bodily segments; in the lower extremities weakness was most severe in the quadriceps, gluteus maximus, posterior tibial, and toe flexor muscles; and in the upper extremities weakness of biceps, supinators, and finger flexors was most pronounced. The patient was in a state of exacerbation as evidenced by heat and swelling in the knees and ankles. Her physical condition was further complicated by family problems which prevented her living at home. She was a very reserved, pessimistic, and unhappy child when admitted, and it was obviously important to attempt to improve her emotional status.

Since she came here directly from school, she was initially started on a routine of bed rest and mild recreational activities such as playing cards and games in her room. Activity was gradually resumed and a treatment program was set up to increase strength and to regain and retain joint mobility. For the first month heat was applied by Hydrocollator packs and paraffin for 20 minutes in the morning, and treatment in the Ille tank was given for 20 minutes in the afternoon. Following the applications of heat she received table treatment twice daily, which consisted of specific active-assistive mobilization of all involved joints, strengthening of entire upper extremities, gluteus maximus, quadriceps, and all muscles about the feet. Particular attention was paid to the intrinsic muscle groups responsible for abduction of the index and middle fingers, adduction of ring and little fingers, abduction and opposition of thumb, and abduction of the great toe.

Director, Unit Physical Therapy, Georgia Warm Springs Foundation, Warm Springs, Georgia.

Figure 1. Splints used at night as part of program to correct hallux valgus.

Swimming and sun bathing were given in the outdoor pool once daily. This pool, which has a temperature of approximately 86 degrees, was opened to the patient rather than using the indoor treatment pool in order to stimulate interest in activity and to take advantage of the sun. Carefully graded swimming exercises were given.

She was permitted to do unsupervised walking only in her room; she walked twice daily under supervision of the physical therapist.

She received occupational therapy for 30 minutes twice daily to strengthen her triceps, straighten the elbows, develop supination of the forearms and radial deviation of her fingers.

A high caloric diet and supplementary feedings were given to increase weight. She also received psychological testing and counselling.

Apparatus used by the patient consisted of night splints to abduct the first metatarsophalangeal joint bilaterally. (Fig. 1)

Salicylates were administered to control pain, and Aralan was prescribed for the purpose of controlling the systemic disease.

Early in the course of the patient's stay the recreational worker made daily visits to play cards and games with the patient in her room. As the program was gradually increased, the patient went to the recreation room for various activities such as playing records, bingo, popcorn parties, and to the Foundation theatre for movies and special shows.

As can be seen from the above outline, physical therapy for the first month consisted of meticulous, active mobilization and strengthening exercises. It was also necessary to grade activity carefully and determine the patient's tolerance to exercise. Whenever there was increased pain and swelling, activity was temporarily decreased and then very cautiously increased again.

The treatment program was changed for the next two months. Ille tank and table treatment were given only once daily for active mobilization of all involved joints. The outdoor pool and sun bathing were continued once daily.

Resistive exercises were begun using a bicycle exerciser, boot with weights for strengthening of the quadriceps and gluteus maximus, dumb bells for exercise of the shoulders and elbows, and putty and a rubber ball exerciser for strengthening the hands. Foot strengthening exercises such as picking up marbles with toes and rolling feet onto outer borders keeping toes flexed were given. She also performed deep knee bends and tip-toeing at stall bars.

Prescribed functional activities consisted of stair climbing, getting in and out of low chairs and bathtub, getting down to and up from the floor, speed walking, walking on toes, and running.

Good to excellent results have been obtained under this treatment program as illustrated by the following comparisons:

Admission (June 8, 1959)	*Present Status* (Sept. 14, 1959)
1. Weight: 68½ pounds	1. 83 pounds
2. Quadriceps — could not extend knee against gravity.	2. Able to extend knees 25 times with 10 pound weight.
3. Knee extension: left, —5 degrees; right, —10 degrees.	3. Knee extension normal.
4. Elbow extension: left, —15 degrees; right, —15 degrees.	4. Elbow extension: left, —5 degrees; right, —5 degrees.
5. Marked muscular weakness in feet and hands with valgus deformities of feet and ulnar deviation of fingers.	5. Deviations almost completely corrected and strength much improved.
6. Not able to swim or float.	6. Able to float and do good elementary back stroke, fair crawl stroke, and swim under water.
7. Gait very slow and awkward.	7. Speed and gait almost normal.
8. Climb steps only one at a time and sideward.	8. Able to climb 7 inch steps frontwards and successively.
9. Not able to run since onset.	9. Able to run slowly.
10. Emotional status poor.	10. A different child emotionally, having lost much of her shyness, happier, with a wonderful sense of humor. In her own words, "I am not nervous anymore like I used to be."

FOLLOW-THROUGH CARE

Since the home situation did not permit this child to be dismissed to her home, and since the boarding

school routine was too much for her at the time, it was necessary to make special arrangements. She went to live with a family near by, continues with treatment, and receives special tutoring at the Foundation school. It is planned to transfer her to public school in the village in the near future with the final goal being dismissal to her home.

COMMENTS

There was nothing new or dramatic in the treatment program this patient received. However, it did require a well trained staff of doctors, nurses, therapists, psychologists, recreation workers and social service workers who with interest and enthusiasm tackled this problem on a twenty-four hour basis. The personal interest of each staff member was important, but there was also an awareness to avoid creating dependency of the patient. The "why" of each phase of the treatment program was carefully explained to the patient and she was encouraged to learn as much as possible about rheumatoid arthritis. Another valuable asset was the relaxed, pleasant atmosphere of an experienced convalescent center as contrasted to the busy, regimented atmosphere of boarding school; the "campus" atmosphere as contrasted to a strictly hospital atmosphere. The treatment program required physical therapists who had the patience to help the patient daily to do specific, active mobilization and strengthening exercises.

It is my belief that the following attributes of a therapist are as important as the treatment procedure:

1. Enthusiasm—an enthusiastic therapist who "sells" necessary treatment to a patient will always achieve better results than a therapist who is not able to motivate her patient.

2. Meticulous attention to detail—it is the careful, day by day awareness of every aspect of the treatment program that contributes so much towards its success.

3. Patience—the very nature of our work demands patience to a high degree. It is the undramatic, repetitious, carefully administered treatment technics that make up such a large part of good physical therapy.

The *Review* invites case reports from physical therapists who have followed an interesting course of treatment with or an unusual response to treatment by patients having one of the conditions listed below.

Industrial accidents
Aircraft injuries
Paralytic dislocation of the hip
Severe burns—a child
Bronchial asthma in geriatric patients
Pott's fracture
Psoriasis
Frozen shoulder syndrome

NOTE: Suggestions for preparation of case reports were published in the October 1957 issue of the *Review*, pages 666-667. Reprints of the suggestions may be requested by writing to the *Physical Therapy Review*.

Information for Contributors

The Physical Therapy Review welcomes original articles of interest to physical therapists throughout the world. Prompt reviewing and processing of papers will be assured if attention is given to the following suggestions.

Manuscripts are accepted with the understanding that they have not been published elsewhere. Contributions may be classified as "Feature Articles," "Suggestions from the Field," or "Case Reports." Feature articles are longer and deal rather extensively with the subject presented; suggestions from the field are brief and describe the instrument or device presented; case reports are short and concerned with discussion of a treatment for a specific type of disease or disability. All material should be presented in a clear, logical, and impersonal discourse.

Submit the original *manuscript* and one carbon copy (keep one carbon copy for your files). All written material should be typed, double-spaced with minimum margins of 1 inch on 8½ x 11 inch opaque white paper. Legends for illustrations, tables, references, and acknowledgments should be placed each on a separate sheet. When citing another author's work, a superscript numeral must appear in the body of the manuscript. The *references* must be accurate and numbered in the order in which they appear in the text. Include the name of each author, title of the article, name of periodical, volume number, inclusive pages, and date.

Illustrations should be protected by cardboard and the name of author and figure number written with soft pencil on the back. If *photographs* are used, sharp black and white prints on glossy

paper are required, avoid distracting backgrounds. Graphs, charts, and line figures drawn with india ink on heavy white paper are necessary for good reproductions. Letters and figures should be large enough so that they will be readable when reduced for publication. Tables are reproduced more legibly when the carbon is reversed and typing occurs on both sides of the paper.

Address manuscripts to:

PHYSICAL THERAPY REVIEW
1790 Broadway—Room 310
New York 19, New York

Suggestions from the Field

Lap Board for the Circ-O-Lectric Universal Hospital Bed

George D. Hancock, Jr., B.S.

A simple, light and inexpensive lap board which can be attached to the new Stryker Circ-O-Lectric Bed (Fig. 1) can be made from the following materials.

Materials:

1 piece of standard plywood 24 inches by 36 inches by ½ inch

Chief, Physical Therapist, Kosair Crippled Children Hospital, Louisville, Kentucky.

2 pieces of aluminum pipe 24 inches by 1¼ inches
4 1 inch pipe clamps
4 sets of stove bolts, lock washers, and nuts 1 inch by ¼ inch

The lap board is attached to the bed by turning the bed rails upside down and securing them in place. The ends of the bed rails are then inserted into the lap board supports. (See fig. 2.)

This lap board can be utilized while the patient is in semireclining, sitting, or standing positions on the Circ-O-Lectric Bed. This bed with the lap board attachment serves as a functional standing table and encourages additional rehabilitative activity through the patient's own efforts.

Figure 1.

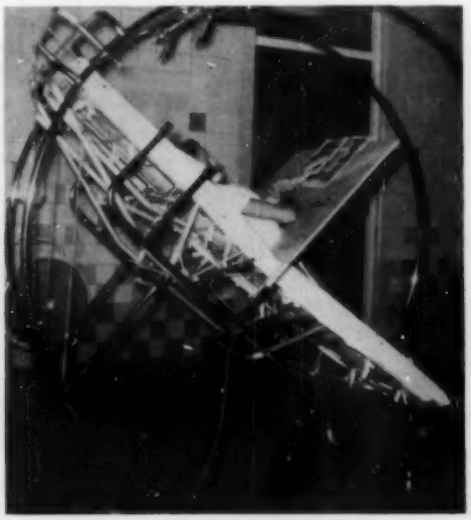


Figure 2.

Editorial

Graduate Education: The Long View

Physical therapy is a profession dedicated to serve a human need. Its service to man rests upon principles rising from those sciences basic to any profession relating to the health arts and sciences. Today we are attempting to discover whether we possess a body of knowledge separate from that of other health professions. Since our search to date has been unsuccessful, we can find reassurance in the words of Herbert Spencer in *The Genesis of Science* (1854): "Without further argument it will, we think, be admitted that the sciences are none of them separately evolved—are none of them independent logically or historically; but that all of them have, in a greater or less degree, required aid and reciprocated it."

Although we recognize our interdependence with other health professions and sciences, the direction and success of our evolution rests with us. Within a brief span of years we have become a profession whose basic education, in the main, is oriented within universities and related schools of medicine and leads to a baccalaureate degree. This is, in part, a reflection both that society and medicine are increasing in complexity and that our interaction with the public and with our professional colleagues requires that we be well educated and professionally competent.

A review of the history of our Association reveals that we have accepted the responsibility to achieve programs of basic professional education that contain the potential of growth and further development. Since interests usually revolve around needs, what are our needs which are solvable through graduate study? Perhaps the answer both to that question and to the evolution of our profession as a science lies in the key word "needs."

We exist only because we serve a human need. We have the right to exist only so long as we contribute to that need. The continual and sometimes explosive changes occurring on the frontiers of medical science profoundly influence both the need for and the manner of our service. In response, we have need continually to evaluate and appropriately adjust our practices and to develop new and specialized skills. We can do this only as we are aware of and understand the new developments and their effects. Moreover, we need to recognize that we too are on the frontiers of medical

science as an associated medical profession. We, also, have responsibility to work at changing contours on those frontiers. Thereby, the separate body of knowledge constituting the science of physical therapy will be evolved. It is only through on-going research of our "professional problems" that we can develop as a profession contributing maximally to human needs.

It would seem that we have been responding to these needs, for we exist and our numbers increase. It would be safe to assume that this would not be true were we not interested in growing beyond our basic professional education. We are interested in self development as demonstrated by our eager attendance and participation at conferences, institutes, and workshops. Developed in response to recognized needs, the postgraduate, short term courses have been utilized by many members to increase their proficiency in and understanding of specialized areas of practice.

Physical therapists have long been making research contributions to solve the problems of the field. These contributions are increasing in number and excellence as members have gained a stronger research orientation. The latter can be directly correlated with the growth of the existing graduate programs in physical therapy, for the needs inherent in the interests which produced these programs can be met satisfactorily only when teaching is associated with the mainstream of medical and biological research. These programs, in their variability, apparently are meeting the needs of members interested in attaining both a broader knowledge of the general field and an increased clinical or teaching competence.

Among the many signs that the profession continues to mature is the fact that members are undertaking graduate study in fields other than physical therapy. Directly or indirectly, the results increase the profession's contribution to man. The field of education, with its many ramifications, has attracted members who are particularly interested in the professional problems of education. Other members have been led to graduate study in the sciences which supply the basic principles which the physical therapist skillfully and artistically adapts in practice. Graduate study culminating in the degree of doctor of philosophy in a basic science is perhaps the most logical avenue through which members can make direct contributions to the development of the science of physical therapy. If these members are sufficiently imaginative, their long and close association with a "community of scholars" should have equipped them for "formalized research" in physical therapy as well as in their newly achieved field of competence. Discovery of new knowledge in either field requires the same attitudes of mind, the same disciplined use of the scientific method, the same or similar research technics, and the critical adaptation of a body of knowledge previously developed through the scientific method.

In their contacts and teaching, frequently in dual academic appointments, member-scholars or members-almost-scholars in a basic science are experiencing something akin to "aid reciprocated" as their integrated knowledge of both fields becomes welcomed and respected.

Through graduate study, i.e., study beyond our basic professional education which leads to an advanced degree, we increase our personal contribution to man and gain its intrinsic rewards. Extrinsically, we gain increasing responsibilities with their inherent recognitions. Since our profession is the collective contribution of the individuals who compose it, the objectives we formulate for our profession can be advanced only as we, as individuals, advance.

LORRAINE F. LAKE
Assistant Professor of
Physical Therapy and Anatomy
Washington University School
of Medicine, St. Louis

Association News

Editorial Board Appoints Consultant Editors

The *Review* Editorial Board has long held a high standard for selection of manuscripts to be published. At the annual meeting January 14-16 the Board agreed that in order to maintain high standards, provide adequate guidance to authors, and render fair decisions, the appointment of specialists as Consultant Editors was necessary.

Physicians and physical therapists have consented to serve for terms of two years as follows:

H. D. Bouman, M.D., Professor of Physical Medicine, University of Wisconsin Medical School; and Editor, *American Journal of Physical Medicine*

Helen J. Hislop, Teaching Fellow of The National Foundation, Department of Physiology, State University of Iowa

Miriam Jacobs, Instructor, D. T. Watson School of Physiatrics, Leetsdale, Pa.; and Instructor, Department of Biological Sciences, University of Pittsburgh

Lorraine F. Lake, Assistant Professor of Physical Therapy and Anatomy, Washington University School of Medicine, St. Louis

Chester A. Swinyard, Ph.D., M.D., Associate Director, Children's Division, Institute of Physical Medicine and Rehabilitation, New York University—Bellevue Medical Center

As with the Editorial Board, Consultant Editors will serve on a volunteer basis. The Association is grateful for their willingness to contribute to the development of our professional journal.

Chapter News

Delaware

A course of study on "First Aid" extended over three chapter meetings.

The Chapter has a few "wanted" members to improve the spread of recruitment information, including *The Return.*

District of Columbia

An article in the February newsletter briefly describes the duties of the Chapter Treasurer. In order to inform Chapter members, duties of other Chapter officers and committee chairmen are to be described in later issues.

Iowa

The Chapter will be host to Nebraska and South Dakota Chapters at a tri-state meeting, April 22-23. The theme, "Problems with Rehabilitation of the Geriatric Patient," will be discussed by physicians, a hospital administrator, and physical therapists.

Kansas

An educational workshop sponsored by the Chapter will be held in Wichita April 23-24.

Massachusetts Chapter

"Research" was the program topic at two of the recent meetings of the Massachusetts Chapter. In December, Dr. Catherine Worthingham addressed the group, emphasizing the importance of research as a factor in the growth of any profession. A follow-up of Dr. Worthingham's remarks was provided at the February meeting. A panel, consisting of Dr. Irving Levine, a neurologist, and two Chapter members, Barbara Lake and Elizabeth Zausmer, discussed their own research projects and, on the basis of their experience, offered to novices suggestions concerning procedures. The panel was moderated by Kathryn Shaffer, a member of the Editorial Board of the *Review.*

Michigan — Eastern District

Three members, with the aid of notes, fellow members' memories, and official records, have compiled a District history. The periods of 1924-1930, 1930-1942, and 1942-1959 are depicted.

Minnesota

The Chapter is planning a meeting to be held during the Upper Midwest Hospital Conference May 11-13 in Minneapolis.

New Jersey

Volume 1, No. 2 of the Chapter newsletter reports the President represented the Chapter at the New Jersey Public Health Association meeting in December. Other members who have addressed professional and lay groups have also been identified.

New York — Greater New York District

The annual Educational Institute, planned for April 15-16, will present concurrent sessions on: Medical Legal Aspects of Physical Therapy, and Biomechanics in the Practice of Physical Therapy.

Pennsylvania

One page in the Chapter's newsletter has been devoted to a "plug" for the Barbershop Quartet competition at Annual Conference. Other articles inform the members of the 1960 Conference Fund and Conference program plans.

Pennsylvania — Eastern District

At a recent meeting, three members gave case presentations on: an athetoid child, a paraplegic, and an amputee. At the same District meeting, slides were shown of the European travels of the members who attended the Third Congress of WCPT in Paris.

Texas — Southeastern District

The topic of the District meeting held in Houston in January was "The Brain Damaged Adult." Combining their talents to present the program were three physical therapists and two physicians.

West Virginia

At a winter meeting of the Chapter, a surgeon was invited to speak on "Surgical Treatment of Vascular Diseases." Included in the program were slides of the vascular conditions discussed.

Educational Seminar in Connecticut

The Connecticut Chapter will sponsor an educational seminar from 9:00 A.M. to 4:00 P.M. on May 7, 1960. The program, to be held at Gaylord Farms Hospital, Wallingford, is divided into two sessions: "Thoracic Surgery" and "Recent Advances in Lower Extremity Prosthetics." A $5.00 registration fee will be charged to APTA members. Lunch will be available at a nominal fee. Interested members should contact:

Miss Rosemarie Casella
Physical Medicine and Rehabilitation Department
Gaylord Farms Hospital
Wallingford, Connecticut

Tri-State Hospital Assembly in Chicago

Host for the joint conference on physical therapy and occupational therapy at the Tri-State Hospital Assembly in Chicago, May 2, 1960, the Wisconsin Chapter has chosen the topic "Hand Rehabilitation."

The joint conference participants, meeting at the Palmer House, will hear Dr. C. Knight Aldrich, Professor and Head of the Department of Psychiatry, University of Chicago, open the program with "Outlets for Aggression." Dr. Paul A. Dudenhoefer, Assistant Professor, Department of Physical Medicine and Rehabilitation, Marquette University, and Chief, Physical Medicine and Rehabilitation, Veterans Administration, Wood, Wisconsin, will discuss "Physical Medicine in Hand Rehabilitation." Mary Eleanor Brown, Chief Research Associate, Western Reserve University—Highland View Hospital Hand Research, Cleveland, will present "The Living Moving Normal Hand" in two parts: kinesiology study aids, and research into extrinsic-intrinsic kinesiology.

Editorial Board Meets

A critical evaluation of the *Physical Therapy Review* was presented by a panel of experts, members of the Metropolitan Chapter of the American Medical Writers Association, at the Thursday afternoon session of the annual meeting of the Editorial Board held in New York, Jan. 14, 15, and 16, 1960. Members of the panel were Dr. William Hammond, Assistant Editor, *New York State Journal of Medicine;* Dr. Robert A. Peterman, Medical Director, Erwin Wasey, Ruthrauff and Ryan, Inc.; and Miss Alvina Rich Lewis, Executive Editor, *New York State Journal of Medicine.* Scientific content, manner of presentation, manuscript editing, and format were among the topics discussed. The Editorial Board has taken under consideration several of the ideas and suggestions with a view to incorporating them in publication of the *Review.*

Miss Lucy Blair, Acting Executive Director, addressed the group Thursday morning, enlight-

ening them on the Association's financial status and the consequent impact on the finances of the *Physical Therapy Review*.

The remainder of the sessions was spent in discussing several matters, including the past year's activities and plans for the future. Kathryn Shaffer, who is responsible for the Abstract Section, reported that a total of 162 articles were abstracted in 1959 and 522 were indexed during that period. Eighty-two book reviews were published last year, according to Jessie Waddell who is in charge of the Book Review Section. Both Miss Shaffer and Miss Waddell expressed appreciation of the fine work contributed by members of the APTA and others in maintaining the excellence of these sections.

Margaret Bryce, who last year was appointed Associate Editor, was given the responsibility of developing the section on Education which was started with the February, 1959, issue of the *Review*.

The most vital and demanding problem which continues to confront the Board is the acquisition of a sufficient number of original articles of high quality. Heeding the strong recommendation of the panel of experts, the Board expects to act more vigorously in solicitation of articles.

Members of the Editorial Board of the *Physical Therapy Review* who attended the three day meeting were Dorothy Voss, Editor-in-Chief; Carol Vance, Managing Editor; and Associate Editors, Barbara A. Friz, Chairman, Margaret Bryce, Kathryn Shaffer, Marian Williams, and Jessie Waddell.

Letters to the Editor

DEAR EDITOR:

In perusing the December issue of the *Review* and other literature concerning "whiplash" injuries there appears to be a general acceptance of the use of cervical traction as a part of the treatment routine, but rarely has there been any mention of the rationale for this technic. Therefore, I am prompted to raise the following questions in the hope of learning what this rationale may be.

1. If it is desired to increase the range of motion of the cervical spine there are a number of movements that can be made with the head, but why include one so unnatural as pulling the head away from the rest of the body?

2. If some of the pain in whiplash injuries is caused by muscle spasm, does traction reduce this spasm? How?

3. If pain is a result of strain or sprain, which is an overstretching and tearing of muscle, tendon, or ligamentous fibers, how is additional stretching going to aid in the healing process? In fact, would traction even be contraindicated?

4. In one article[1] the author stated specifically that traction, when given with the neck flexed at 20-30 degrees, caused the long diameter of the cervical foramen to increase, thereby relieving pressure on the nerve root which passes through the cervical foramen. It is logically assumed that when radiculitis is present, relieving pressure on nerve roots should be helpful, but if radiculitis is not present is traction warranted?

5. I would like to ask about one other treatment technic often mentioned in conjunction with whiplash injuries . . . what rationale is there for the use of deep friction massage?

Sincerely yours,

HAROLD GLICKLIN
Physical Therapist
Hebrew Home for the Aged
Hartford, Connecticut

Cervical traction should not be considered as a "part of the treatment routine" for whiplash injuries. The majority of patients who have had whiplash injury do not need cervical traction. As a general rule, traction should not be applied in the early post-traumatic or acute period. Physicians will sometimes find that radicular symptoms and/or marked limitation of motion in the cervical area persist several weeks following whiplash injury. In these cases it may be advisable to prescribe cervical traction in addition to heat, massage, and active exercises.

Muscles and ligaments that are severely injured tend to develop varying amounts of scarring and shortening during the process of healing. The majority of the ligaments in the cervical area are longitudinal and it is possible that shortening of these longitudinal ligaments may be a factor in restricting mobility of the spine. Adequate traction at the proper time in many of these patients can hasten mobilization of the neck.

The technic of using traction in a slightly flexed position on the cervical spine is well recognized and quite commonly used. In many instances patients tolerate traction better when it is arranged so as to provide 10 to 20 degrees of flexion during the traction period.

It is not known exactly how traction may relieve spasm any more than we can recognize or explain the exact etiological mechanisms involved in the spasm associated with whiplash injury. However, it is often observed that

[1] Benjamin L. Crue Jr., Importance of Flexion in Cervical Traction, Armed Forces Medical Journal, Vol. VIII, No. 3 (Mar. 1957) pp. 374-380.

a patient with considerable cervical spasm will show relaxation of the muscle during the time traction is applied and following the application of traction.

Occasionally the physician finds that deep friction massage may be indicated when there are indurated and tender areas in the deep cervical muscles. Occasionally these areas appear to act as trigger points in causing more spasm and pain. If friction massage is combined with other forms of physical therapy it may prove helpful in restoring the cervical musculature to a more normal physiologic and functional state.

GORDON M. MARTIN, M.D.
Consultant in Physical Medicine and Rehabilitation
Mayo Clinic

Brownsville, Texas
March 1, 1960

I would like to notify the office of my change in address. Let me take this opportunity to say how much I enjoy the *Physical Therapy Review*. A true appreciation for this fine publication is really developed in isolated areas where chances for professional contact are few and far between. I can assure you that my *Review* is an eagerly awaited arrival each month.

Sincerely yours,
MARY EMILY ROMAINE

Report of Executive Committee Meeting and Interim Actions of Board of Directors

The Executive Committee of the Board of Directors met in New York City, Dec. 3, 4 and 5, 1959. The deliberations and resultant actions were concerned with the policies relating to the growth of the profession, membership, finances, relations with allied professions, current and future grants to the Association, personnel, progress reports of various committees, and the World Confederation for Physical Therapy.

The major part of the Board work was transacted at the annual Board meeting and in the Executive Committee meeting, but business requiring immediate attention was transacted by mail during the interim. Agenda for the meetings were prepared by the Acting Executive Director, as administrator of the Association, from questions and problems submitted by individual members, chapters, staff, and Board members.

The following report is an endeavor to keep the membership informed on progress, new activities and policies of the Association.

National Office

Activities and projects were reported by the consultants in each area. Anne Pascasio has joined the staff as a consultant in the Department of Professional Education, following the resignation of Helen Klein.

The Foreign Trained Program was discussed in detail. It was voted to approve the policies now being used by the National Office staff; to recommend continuous study of the Foreign Trained Program by the Advisory Committee on Chapter Activities, as to the implications of state licensure, and to the Judicial Committee, for interpretation of existing and proposed new laws. It was voted that the foreign-trained physical therapist be eligible for inactive membership only while residing in the United States of America.

It was voted to continue the Graduate Study Committee and to go on record as favoring the exploratory session on Graduate Education for Physical Therapists. Beth Phillips was appointed as a member of the Graduate Study Committee in planning the exploratory session.

Finance Committee

The Executive Committee voted acceptance of the proposed revised budget recommended by this Committee.

Review *Editorial Board*

Jessie Waddell, Lansing, Michigan, and Margaret Bryce, Los Angeles, California, have accepted appointments to serve on the Editorial Board from 1959-1961.

Judicial Committee

Clara Arrington, Chairman of the Judicial Committee, has accepted reappointment to serve from 1960-66.

Nominating Committee

Acting on the recommendation of the present Nominating Committee, the Executive Committee appointed Ruby Decker as chairman for 1960-1961. The other members are Virginia Wilson and Dorothy Baethke with two members to be elected at the June 1960 House of Delegates meeting.

Advisory Committees

The following appointments were made to fill vacancies in the respective advisory committees. Professional Education: Dorothy Behlow, Los Angeles, California, 1959-1961; Chapter Activities: James Zimmerman, Columbus, Ohio, 1959-

1964; and Helen Blood was appointed Chairman of the Advisory Committee on Chapter Activities. Dorothy Hoag, Colorado, was reappointed on the Advisory Committee to the Department of Professional Education for a five year term beginning Jan. 1, 1960.

It was recommended that a representative from each Advisory Committee be invited to meet with the Board of Directors in June, 1960, to present the philosophies and recommendations of their respective committees as was done in June, 1959.

Conference Program Committee

The Program Committee, consisting of Hazelle Erickson, Mary Elizabeth Kolb, and Lois Wellock, was authorized to develop the program for the 1960 Conference in Pittsburgh. The theme is "Physical Therapy in Industry." Laura Byrne was appointed to serve on the Conference Program Committee from 1960-1963.

Annual Conference—1963

The Executive Committee voted to accept the invitation of the Ohio Chapter to hold the 1963 Annual Conference in Cleveland, Ohio.

Chapter Bylaws

The amendments to the New York Chapter Bylaws were approved.

American Physical Therapy Association Representatives to Other Organizations

Dorothy Hewitt was asked to be a continuing member on the Advisory Committee on Physical Therapy Education to the Council on Medical Education and Hospitals of the American Medical Association for three additional years, 1959-1961, to conform with a request from the Council for longer and overlapping terms. Thelma Pedersen, a member of the Advisory Committee to the Department of Professional Education, was appointed as an American Physical Therapy Association representative from 1960-1963.

Susanne Hirt's appointment as delegate to the National Health Council until June 1960 was reconfirmed. The Executive Director was appointed a delegate for a three year term, beginning Jan. 1, 1960. She was empowered to designate a consultant on the National Office staff as alternate. An American Physical Therapy Association member from Florida was appointed to serve as a delegate to the National Health Council and to attend its Annual Meeting in March.

It was voted that the term of office for the American Physical Therapy Association representatives on the Board of the American Registry of Physical Therapists be made for a five year period.

World Confederation for Physical Therapy

A report of the Third Congress of the World Confederation for Physical Therapy was given by President Agnes P. Snyder, American Physical Therapy Association delegate to the Fourth General Meeting of the World Confederation for Physical Therapy in September 1959. It was voted that the President of the American Physical Therapy Association, Agnes P. Snyder, be appointed as the American Physical Therapy Association member to the country seat on the Executive Committee of the World Confederation for Physical Therapy and that it be the policy of this Association for the President to serve in this capacity as long as we have a country seat on the Executive Committee of the World Confederation for Physical Therapy.

JEAN C. BAILEY, *Secretary*

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Candidates Continued From March Issue

CANDIDATES FOR NOMINATING COMMITTEE
(Two to be elected for three years)

Lloyd B. Hanson, Self Employed, Escondido, California

Lenore M. Krusell, Supervisor, Respiratory and Rehabilitation Center, University of Wisconsin Medical School, Madison

Lorraine G. Paulson, Chief Physical Therapist, Veterans Administration Hospital, Denver

Kathryn E. Phillips, Coordinator of Therapy, Department of Physical Medicine, Georgia Warm Springs Foundation, Warm Springs

Members' Publications

Mary Eleanor Brown is author of the article of the month, "The Patient's Mobility: Evaluation Methods, Trends, and Principles," published in the February, 1960, issue of *Rehabilitation Literature*. The article is continued in the March issue.

Sara J. Houtz is co-author with Frank P. Walsh, M.D., of an article entitled "Electromyographic Analysis of the Function of the Muscles Acting on the Ankle during Weight-Bearing with Special Reference to the Triceps Surae" published in the December 1959 issue of the *Journal of Bone and Joint Surgery*.

Also, in the same issue, Joan Sciora is co-author with Claude M. Lambert, M.D., of a report, "A Questionnaire Survey of Juvenile to Young-Adult Amputees Who Have Had Prostheses Supplied Them Through the University of Illinois Division of Services for Crippled Children."

Pittsburgh • June 26-July 1 • Penn-Sheraton Hotel

1960 • CONFERENCE

Business Meetings and Program Schedule

June 23, 24, and 25 — **Board of Directors Meetings**

Sunday, June 26

9:00 A.M. — 5:00 P.M. — Section on Education
Self Employed Section
Public Health Section

5:00 P.M. — 10:00 P.M. — Pa Pitt's Melting Pot—Pennsylvania Chapter, Host
Pa Pitt Picnic and Square Dancing

Monday, June 27

9:00 A.M. — 5:00 P.M. — **General Registration**

9:00 A.M. — 12:00 Noon — **Delegates' Registration**

9:30 A.M. — 12:00 Noon — Group Meetings—Crippled Children's Societies, Chapter Legislative Committees, Research Group, State Examining Committees, and others to be announced

2:00 P.M. — 5:00 P.M. — Opening Session—Greetings, President's Address

THE ROLE OF THE EMPLOYER IN THE HEALTH OF THE WORKER, Dudley A. Irwin, M.D., Medical Director, Aluminum Company of America, Pittsburgh; and Miles O. Colwell, M.D., Medical Director, New Kensington Branch, Aluminum Company of America

A LABOR HEALTH PROGRAM: ITS DEVELOPMENT AND SERVICES, Lorin E. Kerr, M.D., Assistant to the Executive Medical Officer, United Mine Workers of America Welfare and Retirement Fund, Washington, D. C.

Tuesday, June 28

9:00 A.M. — 12:00 Noon — THE NEED FOR REHABILITATION IN INDUSTRY, W. Scott Allan, Assistant Vice President, Liberty Mutual Insurance Company, Boston

THE ROLE OF PHYSICAL THERAPY IN MAINTAINING THE EFFICIENCY OF THE WORKER, Jessie Wright, M.D., Associate Professor, Department of Physical Medicine and Rehabilitation, University of Pittsburgh

2:00 P.M. — 5:00 P.M. — **House of Delegates**

7:00 P.M. — 10:00 P.M. — **Film Theater**

Wednesday, June 29

9:00 A.M. — 12:00 Noon — HUMAN FACTORS ENGINEERING: WHAT IS IT?, Howard S. Belding, Ph.D., Professor of Environmental Physiology, Graduate School of Public Health, University of Pittsburgh

Wednesday, June 29
9:00 A.M. — 12:00 Noon

THE ROLE OF THE PHYSICAL THERAPIST IN HUMAN FACTORS ENGINEERING, Pauline Potts, Capt., USAF Physical Therapist, USAF Hospital, USAF Aerospace Medical Center (ATC), Lackland AFB, Texas

THE ENERGY COSTS OF WORK, Amasa B. Ford, M.D., Director of the Rehabilitation and Teaching Program, and Senior Instructor in Medicine, Western Reserve University, Cleveland

2:00 P.M. — 5:00 P.M. **House of Delegates**

6:00 P.M. — 7:00 P.M. Reception for Board of Directors

7:30 P.M. **Annual Banquet**

Thursday, June 30
9:00 A.M. — 12:00 Noon *Concurrent Sessions*

ASSESSMENT OF FUNCTION—Physical therapists will discuss various testing methods. Physicians will observe and report at a general session

Session A

MANUAL MUSCLE TESTS, Jean Bailey, Chief Physical Therapist, Milwaukee County General Hospital, Milwaukee

GROSS MUSCLE TESTS, Margaret Camp, Chief Physical Therapist, Waterbury Hospital, Waterbury, Conn.

ACTIVITY TESTS, Maxine Schuldt, Supervisor of Physical Therapy, Curative Workshop of Milwaukee, Inc.

Physician Observers: Frederick W. R. Koenig, M.D., Chief of Orthopedics, South Side Hospital and St. Joseph's Hospital, Pittsburgh; Paul Kost, M.D., Director of Physical Medicine and Rehabilitation, Veterans Administration Hospital, Pittsburgh

Session B

MOBILITY TESTS, Hildegarde Myers, Chief Physical Therapist, Rehabilitation Institute of Chicago

ELECTRICAL TESTS, Edna Dillon, Major, AMSC, Chief, Physical Therapy Section, Fitzsimons General Hospital, Denver

CIRCULATORY AND RESPIRATORY TESTS, Dorothy Briggs, Fellow of The National Foundation, Department of Physiology, University of Wisconsin

Physician Observers: Harry Fisher, M.D., Orthopedic Surgeon, Presbyterian Hospital, Montefiore Hospital, and St. Francis Hospital, Pittsburgh, and D. T. Watson Home for Crippled Children, Leetsdale; Robert J. Halen, M.D., Works Physician, Pittsburgh Works, Jones and Laughlin Steel Corporation, Pittsburgh

11:00 A.M. — 12:00 Noon *General Session*

THE ROLE OF THE PHYSICAL THERAPIST IN THE EVALUATION OF PHYSICAL IMPAIRMENT, Physician Observers: Dr. Koenig, Dr. Kost, Dr. Fisher, and Dr. Halen

2:30 P.M. — 5:00 P.M. Original Papers (Prepared and read by members)

7:30 P.M. — 10:00 P.M. Chapter Workshops

Friday, July 1
9:00 A.M. — 10:30 A.M. *Concurrent Sessions*

PHYSICAL THERAPY IN TRAUMA AND DISEASE

Session A

SPRAINS, STRAINS AND CONTUSIONS, Barbara Peterson, Director, Department of Physical Therapy, Henry Ford Hospital, Detroit

BURNS, James Roodhouse, Chief Physical Therapist, Institute of Physical Medicine and Rehabilitation, Peoria, Ill.

ARTHRITIC CONDITIONS, Raymond Rabideau, Technical Director, Iron Range Rehabilitation Center, Virginia, Minn.

Session B

SOFT TISSUE SYNDROMES, Margaret Wells, Head of Physical Therapy, Allen-Bradley Company, Milwaukee

HAND INJURIES, Wesley Fegely, Physical Therapist, Campbell Soup Company, Camden, N. J.

PERIPHERAL NERVE LESIONS, Robert Hickock, Coordinator, Division of Rehabilitation, The Jewish Hospital, St. Louis

Session C

LOW BACK DISABILITIES, Nicholas Lorusso, Physical Therapist, Ochsner Foundation Hospital, New Orleans

SPINAL CORD INJURIES, Marguerite C. Rukse, Chief of Physical Therapy, Man Memorial Hospital, Man, West Virginia

FRACTURES AND DISLOCATIONS, Katherine Leary, Supervisor of Physical Therapy, The Rehabilitation Center, Boston

11:00 A.M. — 12:00 Noon *General Session*

THE ROLE OF THE PHYSICAL THERAPIST IN THE INDUSTRIAL PICTURE, Adolph G. Kammer, M.D., Professor, Head of Department of Occupational Health, Graduate School of Public Health, University of Pittsburgh

2:00 P.M. — 5:00 P.M. Program—Tours to Columbia Hospital, Home for Crippled Children, St. Francis General Hospital, South Side Medical Building, and University of Pittsburgh Medical Center in Pittsburgh; Harmarville Rehabilitation Center in Harmarville; and the D. T. Watson Home for Crippled Children and the School of Physiatrics in Leetsdale

Conference Facts

Hotel

The Penn-Sheraton, facing the newly developed Mellon Square.

Rates

Single rooms	$ 8.50 to $14.00
Double bedded room for two, per person	$ 6.68 to $ 8.75
Double bedded room for one person	$ 9.85 to $14.00
Twin bedded room for two, per person	$ 6.92 to $13.00
Twin bedded room for one person	$ 9.85 to $22.00
Parlor and twin bedroom	$27.00 to $40.00
Parlor and two twin bedrooms	$57.00 to $60.00

All rates subject to 4 per cent state sales tax.
Third person in room, $3.00 additional
Family plan, children under 14 free

Hotel Reservations

Send your reservations to the Penn-Sheraton at least 30 days in advance. The Hotel will acknowledge reservations at the nearest available rate if a room at the requested rate is not available. Persons rooming together should send in only one reservation card indicating the number of persons sharing accommodations. *Note:* For your convenience a reservation card is included in your dues notice.

Registration

Active, inactive and foreign probationary members	$6.00
Student members	$2.00
Nonmember physical therapy students	$4.00
Nonmember graduates of approved schools	$15.00
Members of physical therapy organizations affiliated with the World Confederation for Physical Therapy	
Visitors	$6.00
Residents of this country	$15.00

All persons registering will be required to present professional identification.

For the convenience of all, members are requested to register in *advance*. Otherwise, you must present your membership card at the Conference registration desk.

Allied professional persons are invited to attend by presentation of credentials and at a courtesy fee of $2.00

Complimentary registration is cordially extended to physicians and administrators upon presentation of credentials.

Exhibits

Commercial exhibits: Applications should be directed to Gordon M. Marshall, Exhibits Manager, 30 West Washington Street, Chicago 2.

Scientific exhibits: A limited number of scientific exhibits are accepted and assigned by the American Physical Therapy Association.

Social Events

Good cheer and fellowship for all! On Sunday evening the Host Chapter will welcome you at "Pa Pitt's Melting Pot." Afterwards there will be a buffet—"Pa Pitt Picnic"—and square dancing. Wednesday evening is set aside for the traditional and informal banquet with entertainment scaled to your enjoyment. Register in advance and take advantage of the combined price of $12.00 for these two highlighted events. If tickets are purchased separately, prices are: Buffet $6.00; Banquet $7.50

Film Theater

Films are accepted for showing during the Annual Conference on the basis of special interest and relation to the scientific program. Members or organizations desiring to show movies, slides, or filmstrips may apply for inclusion in the program. Applications should be sent to the American Physical Therapy Association before May 1, 1960, and should contain the following information:

Title of film, slides, or filmstrip; producer and/or distributor's name and address; year produced;

Technical data: black and white, or color; sound or silent; film or slide size; running time of film, or number of slides and time needed to show them;

Those films and slides which will be of greatest interest to the audience will be selected.

Conference speakers

W. Scott Allan, Assistant Vice President, Liberty Mutual Insurance Company, received his baccalaureate degree at Clark University, Worcester, Massachusetts, in 1935. Mr. Allan has had 24 years of experience in the field of workman's compensation and, during the last 10 years with Liberty Mutual, specifically in medical service and rehabilitation programs.

He is responsible for the direction of the company's Boston and Chicago rehabilitation center programs, medical adviser program, rehabilitation nurse program, and specialized hospital program for spinal cord injuries. Mr. Allan is also responsible for medical loss control efforts and the significant improvement of job placement programs for handicapped persons. He is the author of numerous articles as well as the book, *Rehabilitation—A Community Challenge,* published in 1958.

Mr. Allan holds membership in many Boston societies and committees. He is a Member of the Corporation and Chairman, Rehabilitation Council, United Community Services; National Advisory Council, Boston University Law—Medicine Research Institute; Incorporator, Trustee, and Member of the Executive Committee, Cooperative Work Conditioning Center, Inc.; Chairman, Massachusetts State Committee, Health Insurance Council; Board of Directors, Bay State Medical Rehabilitation Clinic; and Massachusetts Commission on Employment of the Handicapped. In important ways Mr. Allan serves with the following national organizations: Board of Directors, National Rehabilitation Association; Medical Services Subcommittee, Health Insurance Council; and Joint Medical Subcommittee, and Chairman, Rehabilitation Committee, American Association of Mutual Casualty Companies. Mr. Allan will present "The Need for Rehabilitation in Industry" during the Tuesday morning session of Annual Conference.

Lorin E. Kerr, M.D., is Assistant to the Executive Medical Officer, United Mine Workers of America Welfare and Retirement Fund. Dr. Kerr also holds an appointment as Visiting Professor of Public Health, College of Medicine, Howard University. A graduate of the University of Toledo, Dr. Kerr continued his education at the University of Michigan where he was granted a doctor of medicine degree in 1935 and a master of science in public health in 1949.

Dr. Kerr was affiliated with several city and county health departments before entering the U. S. Public Health Service in 1944 where he served for four years. While in the Service, Dr. Kerr held several positions including those of Divisional Field Medical Officer, War Food Administration; Regional Medical Officer, Farm Security Administration; and Consultant on Medical Care and Public Health to the Board of Directors, Agricultural Workers Health Association. In 1947 and 1948 while in the Industrial Hygiene Division he served as Associate in Medical Care Administration; Liaison Officer to the U. S. Department of Labor, Bureau of Labor Standards; Staff Technician, National Health Assembly, Medical Care Section; and Representative to Inter-Agency Committee of Bureau of Labor Statistics, U. S. Department of Labor.

In 1948 Dr. Kerr became an Area Medical Administrator for the United Mine Workers of America Welfare and Retirement Fund and served the Morgantown, West Virginia, area until 1951 when he was appointed Assistant to Executive Medical Officer.

Dr. Kerr holds membership in: the American Medical Association; National Medical Associa-

tion; Medical Society of the District of Columbia; American Board of Preventive Medicine and Public Health; Fellow, American Public Health Association; American College of Preventive Medicine; Group Health Association of America; and Industrial Medical Association. Dr. Kerr has written several articles related to health services for the worker. During the opening session of the Annual Conference, Dr. Kerr will speak on "A Labor Health Program: Its Development and Services."

Hildegarde Myers, Chief of Physical Therapy, Rehabilitation Institute of Chicago, holds a concurrent appointment as Instructor, Course in Physical Therapy, Northwestern University Medical School. Miss Myers received her physical therapy certificate in 1940 from University of Wisconsin, a bachelor of science degree in 1948 from Loyola University, and attended three special courses in prosthetic education. Miss Myers saw service with the Army at Camp Swift in Texas and in the South Pacific theater from 1942-46 and after discharge was employed by the Veterans Administration. On Thursday morning, during concurrent session B, Miss Myers will speak, on "Range of Motion and Mobility Testing."

Pauline Potts, Capt., USAF, Lackland Air Force Base Hospital, Texas, is a graduate of Southern Illinois University and received her physical therapy certificate at the Army Medical Field Service School in 1949. Captain Potts has previously held positions of: faculty assistant, Southern Illinois University; physical therapist, U. S. Army at Heraick Memorial Hospital, Berkeley, California; and since 1955, physical therapist, U. S. Air Force. She is a member of the American Association for Advancement of Science. Captain Potts will address the Conference Wednesday morning on "The Role of the Physical Therapist in Human Factors Engineering."

Margaret J. Wells is Head of Physical Therapy, Allen Bradley Company, Milwaukee. Miss Wells received her bachelor of science degree at Michigan State University in 1948 and certificate in physical therapy in 1954 at the University of Pennsylvania. She served for two years as a staff physical therapist at the St. Albans Naval Hospital, St. Albans, New York, and currently is serving with the Medical Unit, U. S. Naval Reserve. Miss Wells is a member of Delta Psi Kappa, an honorary society. During the scientific sessions Miss Wells will present "Soft Tissue Syndromes—Industrial Incidence."

The Golden Triangle

By William A. White

Pittsburgh Press Staff Writer

So you'd like to know what you can do, where you can go, the things you can see in Pittsburgh—in spare time, of course—while you are attending the 37th Annual Conference of the American Physical Therapy Association, June 26-July 1.

Well, you won't have to go far from the Penn-Sheraton Convention Headquarters to start seeing things—in fact, a walk of a few blocks will put you right in the thick of a Municipal "renaissance" that has made just about every city in the Nation, and almost every major magazine as well, sit up, take notice, and talk.

That section of Pittsburgh in which the Penn-Sheraton is located is called—around the world virtually—"The Golden Triangle." This is because so much wealth and value have been concentrated in a small triangular area between two rivers, the Allegheny and the Monongahela, which converge at the Point of the Triangle to form another river—the mighty Ohio. Crowded into this Triangle are more real skyscrapers than you'll find in any city in America outside of New York and Chicago.

Today a state park has been established on the site of Fort Pitt, the only remaining part of which is an old blockhouse. This is a place you should see. It would give you some idea of the small seed that sprouted into a mighty city.

Looking down upon the blockhouse now is the Hilton Hotel, half a year old, its exterior a metal of golden hue that contrasts with the silver-like exterior of three Gateway skyscrapers around it and the blue-paneled Pennsylvania State Office Building across Liberty Avenue.

The Bell Telephone Building nearby, an underground garage topped by a beautiful garden, and the spanking new Gateway No. 4, which has an exterior of glass panels, are other "renaissance" developments.

In this same area, on Boulevard of the Allies, is the home of *The Pittsburgh Press*, a Scripps-Howard newspaper and the city's largest in circulation and advertising, which is open to arranged visitations.

Before you leave the "Point" you might visit the studios of KDKA, television and radio, in Gateway No. 1. The radio station is the world's pioneer (licensed Nov. 5, 1920). It broadcast the Harding-Cox presidential election returns in 1920 to score a "first."

While you're in that area, you might want to do some shopping at the Joseph Horne Department store, one of the city's finest. Two other fine stores are Gimbel's and Kaufmann's, near to the Penn-Sheraton.

A block or so from the hotel you can see another city "renaissance," where a Public Auditorium is under construction. Its "magic roof" when completed will open and close.

Now let us take to the hills—specifically to rock-faced Mount Washington, which isn't really a moutain but from which, night or day, there is a breath-taking panoramic view of the "Golden Triangle" and some of the city that sprawls out around it. Below you will be the double-deck Fort Pitt Bridge leading into new tunnels being completed through Mount Washington. And you'll see too the beginning of the new Fort Duquesne Bridge over the Allegheny. All these are parts of a multimillion dollar traffic and parkway program.

There's a thrill in store for you if you ride up the slope of Mount Washington in an "Incline." This is a two-track, two-car cable railway on which the ascending and descending cars counter-balance each other.

From the summit you can see across the Allegheny to the North Side. Here is located Buhl Planetarium, which always has a "sky

Courtesy of the Pittsburgh Convention Bureau

Inclined Cable Line

Courtesy of the Pittsburgh Convention Bureau

Heinz Chapel on the University of Pittsburgh Campus

show" going on and has several permanent science exhibits and astronomical demonstrations.

And a "must" while you are on that side of the river, would be a visit to the H. J. Heinz plant, home of the "57 Varieties." The story of Henry Heinz is one of America's great industrial sagas and a Horatio Alger story as well—the tale of a boy who processed horse radish in his mother's kitchen and sold it door to door from a basket to start a worldwide food business.

Of course you'll have to go to Oakland where the Stephen Foster Memorial beside the University of Pittsburgh is the costliest memorial ever erected to a musician and in it you'll thrill to the old tunes that made this native Pittsburgher famous—but not until after his tragic and premature death.

The Heinz Memorial Chapel on the campus is a monument to the man of the "57 Varieties," an architectural gem. And of particular interest will be the nearby Medical Center, 10 hospitals within a few blocks of each other, including the famous Pittsburgh Children's Hospital.

Walk into Schenley Park—we're still in Oakland—which was given to the city by Mary Elizabeth Schenley, an early Pittsburgh heiress who eloped at 16 with a suave, twice-married English Army officer more than twice her age, and you'll see the "Carnegie Group," gifts of the pioneer steelmaster, Andrew Carnegie. These are:

Carnegie Library, which has more than a million volumes on its shelves; Carnegie Music Hall, still among the world's finest; Carnegie Museum, with prehistoric and modern exhibits; the Art Institute, home of the world's only annual International Art Exhibit; Hall of Architecture, housing outstanding sculptures; and, just out of the park, Carnegie Institute of Technology, one of the Nation's fine engineering schools.

In the park a short distance is Phipps Conservatory, two and a half acres under glass, gift of Henry Phipps, a partner of Mr. Carnegie. It has tropical gardens and orchid and other floral exhibits seldom seen elsewhere.

Still in Oakland, we should not miss Mellon Institute of Industrial Research, called "The Laboratory of the World." Endowed by Andrew Mellon, one-time Secretary of the U.S. Treasury, and his brother, Richard B. Mellon, discoveries and inventions that have come out of it have affected the lives of all of us.

Courtesy of the Pittsburgh Convention Bureau

Cathedral of Learning—University of Pittsburgh

St. Paul's Cathedral, seat of the Catholic Diocese of Pittsburgh, an outstanding example of Gothic architecture, is nearby on Fifth Avenue, and the Young Men and Young Women's Hebrew Association is but a block or so away.

Heading in Fifth Avenue towards Downtown, we see Syria Mosque, home of the world's largest Masonic Shrine; the Pittsburgh Athletic Association; Soldiers and Sailors Memorial.

And we would hardly want to leave Oakland without taking in the Pitt Stadium, where the "Panthers" play, and Forbes Field, where the Pittsburgh Pirates of the National League (baseball) have held forth since 1909. (The team will be home during the Conference and there will be night games.)

You'll probably be able to find the church of your choice within easy walking distance of your hotel, or a short taxi ride from it.

If you didn't fly into Pittsburgh, you'll have to see the Greater Pittsburgh Airport. There is no finer one in the world and the Administration Building houses a hotel, a movie theater, night club, and many shops.

If you are not too tired for after-dark visiting, you might want to take in some of the night spots. There are a number of them, in the city and on the outskirts, many of them usually featuring topnotch stars of stage, screen, and TV. There are fine movie theaters in the Triangle.

A breath-taking night sight can be found by a drive through Liberty Tunnels and south (left) on Route 51. About eight miles out you'll come to a place where rivers, seemingly, of white hot liquid are flowing down what appears to be a gray mountainside, lighting the heavens for miles around.

It is a slag dump of U.S. Steel's Irvin Works, where trains of ladle cars loaded with molten slag are dumped one by one. Tours can be arranged at most steel plants.

Oh, yes, sight-seeing buses will be running while you're here. And you'll be able to ride a "clipper ship" on the rivers around the "Point."

Have fun!

Alumni Meetings at Conference

Monday, June 27

University of Southern California "Mixer"—5:00 P.M.–7:00 P.M.

Wednesday, June 29

Duke University Luncheon—Noon
University of Iowa Luncheon—Noon
University of Wisconsin Luncheon—Noon

Pittsburgh Social Events

Pa Pitt's Melting Pot — Pa Pitt Picnic — Square Dance

37th Annual Banquet

Pa Pitt, through his caricature by cartoonist Cy Hungerford of the *Pittsburgh Post Gazette*, has greeted you in the *Review* since January. On Sunday evening, June 26, in the Pittsburgh Room of the Penn-Sheraton Hotel, Pa Pitt himself will welcome you to his "Melting Pot"; Pennsylvania Chapter members will assist Pa as host—after all, Pa is now 202 years old! Even so, he is mighty alert and has heard of the wonderful time APTA members enjoyed during Minnesota Chapter's reception—Tivoli—last June. He wished he could have been there and hopes that those who were will join the fun at his "Melting Pot."

Pa heard about the Smorgasbord at the Hotel Leamington and says he won't be outdone! So he's planned a picnic which, rain or shine, will be held in the Ballroom of the Penn-Sheraton. Pa is famous for his bountiful picnics, tables laden with the best at the Gateway to the West! During Pa's Picnic the "Steel City Four" will begin the round of singing; everyone will sing; and the "barbershop" quartets from chapters and districts will compete. Pa is sure that after all members have met in his "Melting Pot" the competition will be keen. Pa will award the prize to the winning chapter or district. If you haven't formed a quartet, now is the time!

The evening will be "squared away" with a square dance so wear your picnic clothes, blouses and skirts, slacks and shirts, dungarees or whatever and join the whirl!

On Wednesday evening the 37th Annual Banquet will be preceded by the Reception for the Board of Directors. All members and guests are welcome! To entertain you during the Banquet, The Duquesne University Tamburitzans, America's finest collegiate performing group, will sing, play, and dance.

Again as in Seattle and in Minneapolis, two wonderful evenings will be available to all attending Conference. The combined rate for the Picnic and the Banquet is $12.50. Pennsylvania Chapter through its Western District will be the host with the most at the Melting Pot. Send your checks and reservation forms now for the Pa Pitt Picnic and Annual Banquet; two complete evenings of gaiety and good food will be yours!

University of Pittsburgh Medical Center

Program Tours

University of Pittsburgh Medical Center

The University of Pittsburgh Medical Center has its hub in Oakland with affiliate hospitals scattered throughout Allegheny County. However, the hub of the medical center consists of an impressive array of buildings, all within walking distance of each other. Presbyterian Hospital with 253 beds is the medical and surgical unit for adults. In the same building are two wings which house Woman's Hospital and the Eye and Ear Hospital. The School of the Health Professions of the University is located directly behind Presbyterian Hospital and a special service wing connects the two buildings. Across the street from the School is Jonas Salk Hall, where the polio vaccine was developed and where research into other diseases is a continuing project. Walking out of Jonas Salk Hall one sees toward the left the Western Psychiatric Institute established in 1949 as a teaching and research center for mental illness. Although these are its main objectives, over 13,000 patients receive treatment here annually.

Looking down from the knoll, on which Presbyterian Hospital is located, one sees directly below Children's Hospital, a 210 bed hospital with extensive outpatient services, devoted exclusively to the care of children. To the left is the newest addition to the Medical Center, the Graduate School of Public Health. To the right is the Falk Clinic which cares for patients with limited financial means solely on an outpatient basis. Several city blocks away one can see Magee Hospital wtih 560 beds which specializes in Obstetrics and Gynecology.

A tour of all of the units of the Medical Center with their respective physical therapy departments would be a time consuming, but interesting, trip. Because few of you will find this possible a program tour which will bring to the visitors the spirit of the Center has been arranged.

Harmarville Rehabilitation Center

The Harmarville Rehabilitation Center is a 65 bed institution specializing in the comprehensive rehabilitation of the physically disabled. The Center is located 12 miles north of Pittsburgh on a beautifully wooded bluff overlooking the Allegheny River. The buildings which house the treatment and service areas are fashioned in the "Colonial English Style." It is surrounded by large trees and shrubbery which adds to the country-like setting.

Harmarville Rehabilitation Center

The Harmarville Rehabilitation Center's history dates back to 1913, at which time it was opened as a Nursing Home, caring for those less fortunate members of our Community who were in need of "Custodial and Convalescent Care." In 1928, the need for further services became apparent and more elaborate facilities were constructed to accommodate 70 residents. The physical structure remained the same until 1954, at which time the Rehabilitation services were instituted. At that time the Rehabilitation planning committee met and engaged the services of an architect to expedite the use of present facilities and plan new ones so that services in the medical, social, psychological, and vocational specialties could be developed. The name of the Center was then changed to "The Harmarville Rehabilitation Center," establishing it as the first comprehensive center for adult patients in the Pittsburgh area serving hospitals, physicians, and the welfare agencies of Allegheny County and surrounding communities. These services also include outpatient rehabilitation for those patients who are less severely disabled and for those in which follow-up care is needed after discharge to their homes.

Home for Crippled Children

The Home for Crippled Children, founded in 1902 as a voluntary, nonprofit corporation, is located in a quiet, residential neighborhood not far from the center of Pittsburgh. A group of six buildings is equipped and staffed to provide comprehensive rehabilitation services for one hundred children.

Children who are severely handicapped as a result of physical disability, and who might benefit from a comprehensive rehabilitation regimen, are eligible for admission. The Home maintains a staff of teachers, social workers, clinical psychologists, rehabilitation nurses, physical therapists, dietitians, occupational therapists, speech therapists, bracemakers, a rehabilitation counselor, recreation specialists, dentists, and physicians to provide integrated and effective services. It seeks at all times to consider the total needs of the disabled child.

The staff recognizes that provision of "services" is not enough. Each child differs in his capacity to accept or respond to services and can be influenced by the "climate" in which the child functions. Every person at the Home contributes to that "climate" because every effort is made to imbue each staff member with a sense of his or her place in the total treatment picture —to the end that the greatest possible "capacity

Home for Crippled Children

to respond to services" is developed in each and every child.

Of particular interest to physical therapists are a coordinated program for the cerebral palsied child and an extensive program for preschool children with spina bifida occulta. The Home also carries on the State program for juvenile amputees from the western area of Pennsylvania. The physical therapy staff plays an important role in all of these programs.

St. Francis Hospital

St. Francis General Hospital

St. Francis General Hospital, founded in 1866 by the Sisters of St. Francis, was housed originally in a frame building containing 30 beds. The first brick building was erected in 1871, and shortly thereafter the original building was used for the care of neuropsychiatric patients. By 1891 a second brick building had been constructed. An intern program was begun at that time. Today the medical education program includes a junior intern program for medical students, approved residencies in 10 specialities, and a close affiliation with the University of Pittsburgh School of Medicine.

The neuropsychiatric department of the hospital fulfills a vital need as an integrated facility dedicated to the care of persons suffering nervous and mental disorders. The psychiatric facilities at St. Francis serve to make it truly, a general hospital.

The passing of time brought additional progress to the hospital and preparation to expand its 44 year old department of physical therapy into a modern and complete rehabilitation institute was started. In 1957 construction of a nine story 310 bed addition to the existing facilities was begun. Upon completion of this addition in the spring of 1960, the capacity of the hospital will be increased to 900 beds. A long awaited rehabilitation institute, additional medical-surgical beds, a completely new suite of operating rooms, and a new pediatrics department will be available for improved patient care.

Included in the rehabilitation institute is a large physical therapy treatment area, a therapeutic gym, an extensive hydrotherapy section including a therapeutic pool, an occupational therapy section, a speech therapy section, doctors' offices and examining rooms, social workers' offices, departmental offices, classrooms and research laboratories. The patient area includes bright, colorful two and three bed rooms with a combination dining and recreation area, an outdoor recreation roof and a library for the patients' comfort and entertainment.

Throughout the years St. Francis General Hospital has tried to bring to the citizens of its community every new and modern medical service that is available.

South Side Medical Building

The South Side Medical Building was designed to coordinate and facilitate the practice of orthopedic surgery and physical therapy. Orthopedic surgeons with large industrial practices had experienced great difficulty arranging for treatment in hospital physical therapy departments for the ambulatory patient already back at work. Since most of the patients were examined in the physicians' offices the idea was conceived of a physical therapy department within the office building which would be accessible when patients were being examined and would also be open for treatment of patients after their regular working hours. By having a physical therapy service in the building, it would be possible to maintain closer contact even though the physical therapist was not employed by the physicians. From the beginning, the hours and the case load made it necessary to have two physical therapists. At present there are two full time and five part time therapists on the staff. The department is open four days and evenings. Although in many ways the practice was started for the convenience of industrial cases, it was

found to be satisfactory for other types of patients, so that now only about one third of the patients fall within the industrial category.

The physical layout of the Medical Office Building prohibits its used for a conference planned to present this somewhat unusual approach to better patient care. An auditorium in the Duquesne Brewing Company, a nearby industry whose employees are cared for by this group of physicians, has been made available for the program. After the program a tour is planned to the office building to observe the equipment and the mechanics of such a practice.

The D. T. Watson Home for Crippled Children and the School of Physiatrics

The D. T. Watson Home for Crippled Children and the School of Physiatrics are located on a 140 acre estate about 18 miles northwest of Pittsburgh. The Home, which is a hospital-school for children with orthopedic and neuromuscular disabilities, is a pleasant, modern building, which has served as a model for planning many other similar institutions. So, while the Home itself may remind you of some place you have seen in your travels, the country atmosphere and beautifully landscaped grounds make this a somewhat unusual hospital setting. However, locations and surroundings do not interfere with the busy life and activities necessary to comprehensive medical, social, and psychological services. These services as well as education through high school, are available to 100 resident patients. The Home was opened in 1920 and was, in the beginning, located in the 40 room summer residence of the Watson family. Despite relatively cramped quarters, physical therapy was one of the original services offered to patients and it has always played a significant role in the total program of the Home. At present the department is one of the larger ones in the Western Pennsylvania area.

Under the same administration as the Home, and now occupying the Watson summer residence, is the School of Physiatrics, offering courses for physical therapists, graduate nurses, physicians, and other professional groups. The first student physical therapist was admitted for individual instruction at the time the Home opened and a formal instruction course was instituted in 1927. The School can be considered one of the pioneers in physical therapy education in this country and more than 450 graduates are scattered throughout the 50 states and various foreign countries.

Columbia Hospital

"Population Explosion" has had its effect on Columbia Hospital. Eight miles from downtown Pittsburgh in the Borough of Wilkinsburg, Columbia is the hospital nearest one of the fastest growing residential districts. The outgrowth of a 15 bed general hospital and nurses' training school established in 1906, Columbia has been expanded, renovated, and remodeled. Within the past year a new wing has been opened, increasing the bed capacity from 247 to 336 including 36 bassinets.

D. T. Watson Home for Crippled Children and School of Physiatrics

Columbia Hospital

Surgical cases make up two thirds of the patient load with a high percentage of accident cases. Over 14,000 such cases were treated last year in the Emergency Room. Many of these accidents occur in the numerous industrial plants and on the high speed highways nearby.

To accommodate the ever increasing need for treatment and rehabilitation of these and other types of cases, Columbia's Physical Therapy Department has been revamped twice in the past eight years. It now consists of a treatment room, hydrotherapy room and a fully equipped gymnasium. These facilities are also used in the curriculum of the hospital's training school for nurses as well as affiliating physical therapy students. Because the average span of hospitalization for the patient at Columbia is relatively short, the preponderance of the case load in this department is comprised of outpatients.

Columbia, proud to grow with its neighbors, keeping pace with all that is new and progressive, retains its character as a community hospital.

Reserve Officers of the Army Can Earn Credit in Pittsburgh

The Commanding General, U. S. Continental Army Command, has approved the awarding of retirement point credits for Army Reserve Officers who attend specified sessions of the American Physical Therapy Association Conference in Pittsburgh, Pennsylvania in June.

Provision will be made for Reservists to register in the lobby of the Penn-Sheraton Hotel.

Military Physical Therapy Symposium
Military Section of the
American Physical Therapy Association

Penn-Sheraton Hotel — Pittsburgh, Pennsylvania

26 June—1 July 1960

Military Chairman—Major Mary E. Frazee, AMSC

The following sessions, by virtue of their military educational value, are included in the symposium and are authorized as military training assemblies. Reserve officers of the Army are therefore eligible to earn training and retirement point credits for attendance at the sessions indicated below providing such attendance at any session is for a period of not less than two hours and registration at each session is accomplished with the individual designated by the Commanding General to accomplish such registration. Not more than one credit can be granted for any single calendar day:

PROGRAM SESSIONS

Monday, 27 June 1960 1400-1700

The Role of the Employer in the Health of the Worker

Tuesday, 28 June 1960 0900-1200

The Need for Rehabilitation in Industry
Maintaining the Health of the Worker

Wednesday, 29 June 1960 0900-1200

Human Factors Engineering: What Is It?
The Role of the Physical Therapist in Human Factors Engineering
Fatigue

Thursday, 30 June 1960 0900-1200

Concurrent Sessions:

Assessment of Function
Manual Muscle Tests, Gross Muscle Tests, Activity Tests
Mobility Tests, Electrical Tests, Circulatory and Respiratory Tests
The Role of the Physical Therapist in the Evaluation of Physical Impairment

Friday, 1 July 1960 0900-1200

Concurrent Sessions:

Physical Therapy for Trauma and Disease
Sprains, Strains, Contusions
Burns
Arthritic Conditions
Low Back Disabilities, Spinal Cord Injuries, Fractures, and Dislocations
The Role of the Physical Therapist in the Industrial Picture

The 1959-1960 Duquesne University Tamburitzans, orchestral ensemble, in holiday attire

The Tamburitzans

Since 1937 the Duquesne University Tamburitzans have been building for themselves an enviable and uncontested reputation as America's finest collegiate performing group. From a scant beginning the group has expanded to a corporation giving scholarship benefits of over a half million dollars to prospective "Tammies" each year. Those who measure up to the rigid and artistic standards of the organization are accepted for four years of university education in whatever field they choose.

The Tamburitzans take their name from a stringed lutelike instrument, "the tamburitza," national instrument of many peoples of the Balkan peninsula. Other instruments supplement the tamburitza, such as the accordion, clarinet, folk pipes, and drums, and play an important part in the program, along with vocal and dance presentations.

Brilliantly costumed in authentic peasant attire, the Tammies will present a program during the Annual Banquet based on their repertoire of village dances from Croatia and Serbia along with the vigorous dances of the Bulgarians, Russians, and Macedonians. The performance of the Tamburitzans, each of whom plays several instruments, dances, and vocalizes with ease, will be one of the most effervescent and fast-moving ever enjoyed by APTA members.

Self Employed Section

The Self Employed Section will hold its Annual Meeting at the Hotel Penn-Sheraton in Pittsburgh, on June 26, 1960.

During the morning session original papers by members will be presented. These will outline the development and management of services by self-employed physical therapists.

The afternoon session will include a business meeting and a film presentation describing a physical therapy service at the core of a medical community.

All members in good standing of the Association are welcome to attend the entire program.

All applications and inquiries regarding the Section should be directed to:

Mr. Joseph Savan, Corresponding Secretary
462 North Taylor
St. Louis 8, Missouri

Section on Education

The annual meeting of the Section on Education will be held on Sunday, June 26, 1960, at the Penn-Sheraton Hotel in Pittsburgh, from 9:00 A.M. until 4:30 P.M., with a luncheon-business meeting at noon.

The theme of the all-day meeting will be

graduate education. Speakers will include Dean Wesley G. Hutchinson of the School of Allied Medical Professions, University of Pennsylvania; Dr. Howard G. Miller, Head of the Department of Psychology, North Carolina State College; and a group of physical therapists who have pursued graduate education in physical therapy and other fields. Mildred Wood, chairman of the Graduate Study Committee, will report on the APTA-OVR Exploratory Session on Graduate Education held in October, 1959. Under the guidance of the speakers there will be general discussion following the afternoon presentations.

Early in May, Section members will receive an announcement of the final program plans and the slate of officers drawn up by the nominating committee. This mailing will include luncheon reservation applications.

Public Health Section

The annual meeting of the Public Health Section will be held in Pittsburgh, on Sunday, June 26, 1960, from 9:00 A.M. to 5:00 P.M. All members of the American Physical Therapy Association who are interested in physical therapy in public health settings are invited to attend.

The program is not as yet in its final form, but it is planned that the morning session will be devoted to a discussion of the role of the physical therapist in public health with Dr. Jack Sabloff of the Division of Maternal and Child Health in the Pennsylvania Department of Health as one of the speakers. There will also be discussion of the use of public health facilities for clinical practice for physical therapy students. It is possible that the afternoon session may be devoted to discussion of physical therapy in schools for the handicapped, but specific plans for this are not definite at this time.

Following the afternoon session there will be a short business meeting for members of the Public Health Section. Any member of the American Physical Therapy Association holding a position concerned with physical therapy in a public health setting is eligible for membership in this Section.

Application for membership should be sent to the Treasurer:

Miss Lois Mitchell
1664 Monroe Street
Madison 5, Wisconsin

The annual dues of $1.00 should accompany the application.

Pittsburgh is the Greatest!

Located in the Pittsburgh area are the world's largest

Steel producers	U.S. Steel Corporation
Steel fabricator	American Bridge Corporation
Food products (of its kind)	H. J. Heinz Company
Coal mine	Robena (U.S. Steel)
By-product coke plant	Clairton (U.S. Steel)
Independent oil company	Gulf
Builder of coke ovens	Koppers Company, Inc.
Producers of bituminous coal	Consolidated Coal Co.

and the world's largest producers of

Tin plate	U.S. Steel Corporation
Aluminum	Aluminum Company of America
Glass	Pittsburgh Plate Glass Company
Safety equipment	Mine Safety Appliances Company
Rolling mill machinery	Mesta Machine Company
Air brakes	Westinghouse Air Brake Company
Steel rolls	Blaw-Knox Company
Refractories	Harbison Walker Refractories Company
Lifting jacks	Duff-Norton Company
Bolts, nuts, and rivets	Pittsburgh Screw and Bolt Co.
Stainless steel	Allegheny Ludlum Steel Corporation
Wrought iron pipe	A. M. Byers Company

Correction

Illustrations for "The Golden Triangle" by William A. White in this issue of the *Review* were furnished by the Pittsburgh Convention Bureau.

Photographs of Mellon Square (February) and Pittsburgh—Past and Future (January) were also used through the courtesy of the Pittsburgh Convention Bureau. We regret that, through error, credit was not properly given.

Time to Rehearse for Pa Pitt's Songfest

Barbershop Quartet Competition

Hi P.T.'s young and gay—
Ope your mouths and gently bray
Lift your spirits and don't be thrifty;
Come to Pittsburgh in 1960.

Sing—sing—sing

The White House

NATIONAL YOUTH FITNESS WEEK, 1960

BY THE PRESIDENT OF THE UNITED STATES OF AMERICA

A PROCLAMATION

WHEREAS the fitness of our young people is essential to the strength and progress of our Nation; and

WHEREAS we must always strive to improve the well-being of our youth by determined and coordinated efforts in their areas of learning, work, play and matters of the spirit; and

WHEREAS, in this challenging world, fraught with peril on every side, it is imperative that our young people recognize their obligations to themselves, to their families, and to all of us, in order to prepare themselves for lives of satisfying and useful citizenship; and

WHEREAS the President's Council on Youth Fitness has recommended that the week beginning May 1, 1960, be designated as National Youth Fitness Week:

NOW, THEREFORE, I, DWIGHT D. EISENHOWER, President of the United States of America, do hereby proclaim the week beginning May 1, 1960, as National Youth Fitness Week.

I request officials of the Government, and I urge parents, young people, and interested national and local organizations, to use all appropriate means now and during that week to promote programs and activities demonstrating the importance of youth fitness to the end that we may assure the continuing strength and well-being of our people.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Seal of the United States of America to be affixed.

DONE at the City of Washington this tenth day of September in the year of our Lord nineteen hundred and fifty-nine, and of the Independence of the United States of America the one hundred and eighty-fourth.

(Seal)

By the President:

DOUGLAS DILLON

DWIGHT D. EISENHOWER

"FITNESS CAN KEEP U. S. STRONG"

(Official Slogan for National Youth Fitness Week, 1960)

Qualities of Leadership

Our youth need to develop qualities of leadership. They need to learn the value of staying power—stick-to-it-iveness. They need to learn devotion to duty—the devotion to duty that keeps a good doctor on the job right around the clock in an emergency—the devotion to duty that leads a scientist or a teacher to persevere in a low paying position in the public service because that is where his or her maximum contribution can be made.—Secretary of Agriculture Ezra Taft Benson, Sept. 8, 1958.

Education

Films of Interest

PRESCRIPTION O.T.—30 min., b/w, sd., 1959. Central Office Film Library, Veterans Administration, Vermont Ave. and H St. N.W., Washington 25, D.C. This new film produced by Columbia University's Graduate School of Journalism under the direction of the Occupational Therapy Staff and the Physical Medicine and Rehabilitation Service of the Veterans Administration Hospital, Bronx, New York. It describes present practices in O.T. Using the V.A. terminology (kinetic, metric, tonic, etc.) the goals of O.T. are stated and patient treatments consistent with these goals are shown. The acting is good; the photography fair. Narration and written leads are sometimes too fast for full comprehension. This film offers an interesting and succinct explanation of the field of occupational therapy. It does not indicate the relationship of O.T. to other fields in the total planning for the patient. Related fields are mentioned only as other members of the rehabilitation team under the direction of the physiatrist.

MANAGEMENT OF BURNS—Part 2, Local Care—15 min., color, sd., 1958, Nearest U. S. Army Film Library.

MEETING IN SESSION—20 min., b/w, sd., 1953, Bureau of Publications, Teachers College, Columbia University. Shows group behaviour in two different settings. Five nurses discuss staff problems, first, with an autocratic head, and second, with constructive group interaction.

ELECTROMYOGRAPHIC PROCEDURES—7 min., color, sd., 1958. U.S. Army Film Library. Clinical application of electromyography in diagnosis, treatment, and prognosis.

EPIDEMIOLOGY OF STAPHYLOCOCCAL INFECTIONS—13 min., color, sd., 1958. U.S. Public Health Service, Fourth Street and Independence Ave., S.W., Washington 25, D.C. Traces an infection, showing how hospital personnel may carry.

AGING: A MODERN SOCIAL ACHIEVEMENT—12 min., color, sd., 1957. University of Michigan Audio-Visual Education Center, Ann Arbor, Michigan. Describes social changes of past half-century; discusses changes related to longer life and explains implications of these for future.

DYNAMIC POSTURE—24 min., b/w, sd., 1957. Association for the Aid of Crippled Children, 345 E. 46 Street, New York 17, N. Y. The postures of lying, sitting, standing; their variations and the relationship of posture to comfort, mechanical efficiency, and physiological functioning.

REACH FOR TOMORROW—27 min., b/w, sd., 1958. National Society for Crippled Children and Adults, 11 South La Salle Street, Chicago 3, Ill. Describes the rehabilitation of five patients. Shows scope of the Society's services.

MASSETER, TEMPORAL MUSCLES AND TEMPORAL FASCIA—Head and neck anatomy series, no. 5. 64 min., color, sd., 1959. Central Office Film Library, Veterans Administration, Vermont Ave. and H Street N.W., Washington 25, D.C. Cadaver dissection.

CONGESTIVE HEART FAILURE—10 min., color, sd., 1959. Motion pictures, Sharp and Dohme, Division of Merck and Co., Inc., Philadelphia, Pa. Uses animation to show the pathology of the condition and specific steps to improve the heart's efficiency.

DYNAMICS OF PHAGOCYTOSIS—29 min., b/w, sd., 1958. Pfizer Laboratories, 1500 16 Street, San Francisco 3, Calif. Shows what actually happens when streptococci and neutrophils interact and reports on recent research on phagocytosis.

NURSING CARE WITH A STRYKER FRAME—15 min., b/w, sd., 1958. U.S. Army Film Library. Describes frame and nursing technics.

THE USE OF THE PROBLEM IN TEACHING—28 min., b/w, sd., 1958. An Air Force film. Order no. TF1-5255, U. S. Office of Education, Fourth St. and Independence Ave., S.W., Washington 25, D.C. An Air Force instructor uses a clever method to impress his students with the principles and technics of using the problem as a teaching aid.

AS OTHERS SEE US—15 min., b/w, sd., 1945. American Hospital Association, 18 East Division Street, Chicago 10, Ill. Contrasts the hospital experience of two women, pointing out the impressions made by hospital personnel upon patients and the community.

HOSPITALS ARE PEOPLE—18 min., color, sd. American Hospital Association, 18 East Division Street, Chicago 10, Ill. Shows the variety of hospital departments and services as a volunteer worker takes a patient on a tour of a hospital.

WHEN THERE'S A WILL—15 min., b/w, sd., 1957. University of Connecticut School of Home Economics, Storrs, Conn. How four handicapped mothers succeeded in caring for their children. Introduction by Dr. Lillian Gilbreth.

PSYCHIATRIC NURSING: THE NURSE-PATIENT RELATIONSHIP—34 min., b/w, sd., 1958. ANA-NLN Film Service, 10 Columbus Circle, New York 19, N. Y.

A CHANCE—15 min., color, sd., 1957. Goodwill Industries of America, 1229 20th Street, N.W., Washington 6, D.C. A dramatization about the rehabilitation services of Goodwill.

THE MAN WHO DIDN'T WALK—32 min., b/w, sd., 1958. Motion Picture Library, American Medical Association, 535 N. Dearborn St., Chicago 10, Ill. About a malingerer and the complex medical and legal problems in traumatic neurosis. The third film in the series "Medicine and the Law."

THE DOCTOR DEFENDANT—30 min., b/w, sd., 1957. Motion Picture Library, American Medical Association, 535 N. Dearborn St., Chicago 10, Ill. Second in the series "Medicine and the Law," this film is concerned with the subject of professional liability.

Neuromuscular Facilitation Technics

The Boston University Sargent College, Department of Physical Therapy announces an Introductory Course in Neuromuscular Facilitation Technics to be given under the direction of Margaret Knott, Physical Therapy Director, California Rehabilitation Center, from June 13 to June 24, 1960.

The course will include instruction in the theory and practice of technics, and an analysis of muscle function in patterns of facilitation. Opportunity will be given for practice under supervision and observation of treatment procedures. Tuition for the course is $90.00 which may be taken for three semester hours credit. Rooms will be available in a Boston University Dormitory for a minimum of $15.00 a week.

The closing registration date will be June 1, 1960. Registration will be limited to 30 qualified physical therapists who are members of the American Physical Therapy Association, or physical therapists trained outside the United States who are eligible to fulfill requirements for membership in the APTA. Students will be selected as applications are received, but the right to select students on a geographical basis is reserved.

Those interested should apply to Professor Adelaide L. McGarrett, Physical Therapy Director, Boston University Sargent College, University Road, Boston 15, Massachusetts. Please indicate whether a room is desired.

Student Column

The Beginning

On October 27, I was introduced into a new world—a strange world of starched white fabrics, sterilized needles, metal chairs, short white gowns, and sphygmomanometers. These items and many more have now become parts of a whole—parts which have fitted together to form many and varied experiences all of which have been of great value to me—in terms of learning to work with patients, cooperating with team members, understanding the organization of the hospital's physical plant, increasing my vocabulary, and in my contact with hospital staff and physicians. It is because of these experiences and others which I have been fortunate to have, that I feel this practical duty so worthwhile.

In the past two weeks I have been able to put into practice what I learned from books and outlines. I have been able to apply these facts so as to promote the welfare of the patient and at all times have been aware of student relations with hospital staff—as to respect, tact, and consideration.

In class we were told each person is an individual with a personality integration all his own. Now, I realize this even more; each person reacts differently, many factors contributing to his type of response. As an example, I recall the reactions of different patients to having their blood pressure taken. Some appeared calm, others hesitant, while still others begrudingly submitted, but only after asking many questions and making statements as to their personal feelings about the importance of such a procedure.

In the short time I have had practical duty, I have found an integration of theory and practice to sociology and psychology, learned months ago. I realize that each patient, regardless of social status, profession, trade or illness, is reaching out for friendship and comfort as well as physical improvement. I had one patient who held a highly responsible government position with complete financial security yet who still was depressed and had pangs of loneliness. Another, a little woman with no family, had built her own small world and was knitting a Christmas stocking for a grandson who did not exist. In each incident, the patient responded warmly to kindness, conversation, and personal interest.

Now, this once-new world of hospital life is daily becoming a familiar and vitally interesting part of my own world.

JULIE BENSON
Junior Class, Section of Physical Therapy
University of North Carolina

Index to Current Literature

(continued from page 252)

Vivian E. Holdsworth, Am J. Nurs., 59: 1724-1725, December 1959

MISCELLANEOUS

Management of Decubitus Ulcers. Andor A. Weiss, N. York State J. M., 60: 79-82, Jan. 1, 1960

Specific Development Disorders of Speech in Childhood. T. T. S. Ingram, Brain, Lond., 82: 450-467, September 1959

The Skeletal Complications of Pregnancy. Campbell C. McCullogh, Jr. and A. B. Sinclair, Jr., J. Internat. Coll. Surg., 32: 642-646, December 1959

Guide To Graduate Education

Any physical therapist contemplating a program of advanced study is encouraged to inquire of several colleges or universities in order to find a program compatible with his interests and needs.

A wide variety of programs is available throughout the United States and Puerto Rico. The following list is indicative only of some opportunities in the universities which offer approved courses in physical therapy.

Some areas of major study on masters/doctoral level	*Location of course*	*For information/bulletin, contact:*
2-10	College of Medical Evangelists Loma Linda, Calif.	Keld J. Reynolds, Ph.D. School of Grad. Studies
1-2-3-4-5-7-9-10-11-12	Stanford University Palo Alto, Calif.	Rixford K. Snyder Director of Admissions
8	Division of Physical Therapy Stanford Med. Center	Marian Williams, Ph.D.
2-5-9-10-11	Grad. Div., Northern Section U. of Calif., Berkeley 4	Dean of Graduate Division
	U. of So. Calif., Los Angeles 7	
1-2-5-6-10-11-12	Graduate School	Milton Kloetzel, Dean
8	P. T. Department	Margaret S. Rood
	University of Colorado	
2	Medical Center, Denver 20	A. R. Buchanan, M.D.
8		Dorothy Hoag
10		C. A. Maaske, Ph.D.
5-9-11	Graduate School, Boulder	Office of Admissions
1B-5-9-11-12	U. of Conn., Storrs	N. L. Whetten, Ph.D. Dean, Graduate School
1A-2-3-5-6-8-9-10-11-12	Grad. Sch., Northwestern U. Evanston, Ill.	Mrs. Janet L. Green Secretary for Admissions
	Indiana University	
9-11	Grad. School, Bloomington	J. W. Ashton, Ph.D., Dean
4-5	Sch. of Ed., Graduate Div. Bloomington,	H. T. Batchelder, Ph.D. Associate Dean
2-10	Sch. of Med., Indianapolis	John Van Nuys, M.D., Dean
2-5-9-10-11-12	*State U. of Iowa, Iowa City	W. F. Loehing, Dean, Grad. Coll.
8	Children's Hosp.	Wm. D. Paul, M.D.
2-4-5-9-10-11	University of Kansas Lawrence	John H. Nelson, Ph.D. Dean, Graduate School
	University of Maryland	
1-3-5-6-7-9-11-12	Graduate School, College Park	For either: Ronald Bamford Ph.D.
2-10	Sch. of Med., Baltimore 1	Dean, Graduate School
	Boston U., Boston, Mass.	
1-2	Graduate School	Edward K. Graham, Dean
5-6	School of Education	Donald Hayes, Registrar
1-2-3-5-9-10-11-12	University of Michigan Ann Arbor	Admissions Office, Horace H. Rackham, Sch. of Grad. Studies

1—Administration
1A—Hosp. Administration
1B—Bus. Administration
2—Anatomy
3—Chemistry
4—Education including Guidance & Counseling
5—Education
6—Guidance & Counseling
7—Human Relations
8—Physical Therapy
9—Physics
10—Physiology
11—Psychology
12—Others

* Partial credit of basic Physical Therapy program towards masters degree *if* student meets Graduate School requirements.

Some areas of major study on masters/doctoral level	*Location of course*	*For information/bulletin, contact:*
1-2-3-5-6-9-10-11 8	The Graduate School U. of Minnesota, Minneapolis	Theodore C. Blegen, Dean Mrs. Ruby M. Overmann
1A-5-9-10-11	St. Louis University St. Louis, Mo.	Robert J. Henle, S.J., Ph.D. Dean, Graduate School
1A-1B-2-3-4-5-6-9-10-11-12	Washington University St. Louis 30, Mo.	Lewis E. Hahn, Ph.D., Dean Graduate Sch., Arts & Sciences
2-3-9-10-11-12	Columbia U. New York 27 Faculty of Pure Science Morningside Heights	Prof. Marshall Kaye
1-5-6-7-11-12	Teachers' College 525 W. 120 St. New York 27	Admissions Office 525 W. 120 St. NY 27, NY
2-9-10-11-12 1-5-6-7-8-11-12	*New York U., New York 3 Grad. Sch., Arts & Sciences School of Education	Office of Admissions Office of Admissions
2-9-10-11 1-5-6-12	U. of Buffalo, Buffalo 14, N.Y. Grad. Sch., Arts & Sciences School of Education	H. M. Woodburn, Dean Robert S. Fisk, Dean
1A-2-3-5-9-10-11-12	*Duke University, Durham, N.C.	Dean of Graduate School
1B-2-3-4-5-9-10-11-12	Grad. Sch., U. of N. Carolina Chapel Hill	George A. Heard, Ph.D. Dean
1-2-3-5-6-9-10-11-12	Grad. Sch., Ohio State U. Columbus 10	Dean of Graduate School
3-4-5-9-11-12 2-10-12	University of Oklahoma Graduate College, Norman Medical Center, Okla. City	For either: Dean of Grad. Coll., U. of Okla., Norman
2-4-5-7-9-10-11-12	U. of Pennsylvania, Phila. 4	Grad. Sch., Arts & Sciences
2-3-10-12 2-3-10-12	Baylor U. Med. Center, Dallas, Tex. Grad. Resch. Inst., Dallas, Texas	For either: Div. of Grad. Sch. Baylor U., Waco, Tex.
2-10	U. of Texas—Medical Branch Galveston	Donald Duncan, Ph.D. Assoc. Dean of Graduate School
2-10	Medical College of Virginia Richmond 19	Ebbe Hoff, Dean Sch. of Grad. Studies
2-5-9-10-12 8	Marquette U., Milwaukee 3, Wis. Graduate School PT Curriculum, Sch. of Med.	Lawrence W. Friedrich, S. J. Dean Beth Phillips, Director
1-2-3-4-5-7-8-9-10-11-12	Graduate Sch., U. of Wisconsin Madison 6	Dean, Graduate School 150 Bascom Hall

Schools Offering Courses in Physical Therapy

The listing of undergraduate programs which has appeared monthly in the *Review* will now be published four times a year in the March, June, September, and December issues. The listing last appeared in the March issue and will be published next in the June issue. Each month the issue in which the listing was most recently published will be identified in the Table of Contents under Regular Features.

Mary McMillan's Photograph

As a commemoration of Mary McMillan, our Founding President, friends and members of the profession may wish to have a print of the portrait-photograph which appeared in the February 1960 issue of the *Review*. The prints are suitable for framing and may be obtained from the National Office at a cost of $1.00 each.

Additional copies of the February *Review*, dedicated to Miss McMillan, are available from the National Office at the usual cost.

SHORT TERM COURSES FOR GRADUATE PHYSICAL THERAPISTS

Title of Course	*Sponsor of Course*	*For Details Contact*	*Dates of Course*
Cerebral Palsy	The North Carolina Cerebral Palsy Hospital Durham, North Carolina	Dr. Lenox D. Baker Medical Director No. Carolina C. P. Hosp. Durham, North Carolina	Courses arranged according to individual need—duration 3 months
Physical Therapy in the Care of Neuromuscular Disease	Georgia Warm Springs Foundation Warm Springs, Georgia	Robert L. Bennett, M.D. Medical Director Ga. Warm Springs Found. Warm Springs, Georgia	January April October
Technics of Neuromuscular Reeducation	California Rehabilitation Center Vallejo, California	Margaret Knott, Chief P. T. Calif. Rehab. Center Vallejo, Calif.	January 1 April 1 July 1 October 1
Functional Bracing of the Upper Extremities	U. of California and U. S. Office of Vocational Rehabilitation	Prosthetics Education Program Rm. B4-229, Medical Center University of California at Los Angeles 24, California	June 13—17, 1960
Upper Extremities Prosthetics	Postgraduate Medical School & College of Engineering New York University	Prosthetics Ed. Program New York University Postgrad. Medical School 550 First Avenue New York 16, N. Y.	May 31—June 10, 1960
	U. of California and U. S. Office of Vocational Rehabilitation	Prosthetics Education Program Rm. B4-229, Medical Center University of California at Los Angeles 24, California	May 9—13, 1960
Lower Extremity Prosthetics	Postgraduate Medical School & College of Engineering New York University	Prosthetics Ed. Program New York University Postgrad. Medical School 550 First Avenue New York 16, N. Y.	Apr. 18—29, 1960
Above-Knee Prosthetics	Northwestern U. and U. S. Office of Vocational Rehabilitation	Director of Prosthetic Education Northwestern U. Med School 401 E. Ohio St. Chicago 11, Illinois	June 20—24, 1960
Below-Knee Prosthetics	Northwestern U. and U. S. Office of Vocational Rehabilitation	Director of Prosthetic Education Northwestern U. Med School 401 E. Ohio St. Chicago 11, Illinois	May 9—20, 1960
P.T. 502-a—Anatomy for Therapists	University of So. California Physical Therapy Department University Park Los Angeles 7	Mrs. Roxie Morris Professor of Physical Therapy	August 1—26, 1960
P.T. 511 Neurophysiology in the Treatment of Neuromuscular Dysfunction	University of So. California Physical Therapy Department University Park Los Angeles 7	Margaret S. Rood Head	July 11—29, 1960
Cystic Fibrosis	Children's Hospital Medical Center 300 Longwood Avenue Boston 15	Shirley M. Cogland Director of Physical Therapy	June 6—10, 1960
Treatment for the Cerebral Palsied	Children's Rehabilitation Institute for Cerebral Palsy Reisterstown, Maryland	Christopher H. Wiemer Executive Director Children's Rehab. Inst. Reisterstown, Maryland	July 5—Sept. 16, 1960 Oct. 3—Dec. 16, 1960

Abstracts

Effect of Lowering of Body Temperature on the Symptoms and Signs of Multiple Sclerosis

C. Wesley Watson (Neurology Service, New England Center Hospital, Boston), N. ENGLAND J. M., 261: 1253-1259, Dec. 17, 1959

This report describes certain acute effects of lowering of body temperature upon the symptoms and signs of multiple sclerosis. Previous investigators have reported that the worsening of symptoms that occurs with heating of the body and elevation of its temperature is followed, upon recooling, by a restitution of the symptoms and signs to the state that existed before heating. There are also references to a reduction of spasticity of parts of body to which cold had been applied by ice or by immersion in cold water.

Dr. Watson conducted a detailed study under controlled conditions to show that symptoms and signs of multiple sclerosis may improve after exposure to cold. A reduction of body temperature of about 1 degree F. was necessary for such improvement. Eight patients were examined before, during and after exposure to cold water or cold air for the presence and degree of deficits of nervous system function. The methods of cooling included immersion of the body to the waist or neck in a large tub of cold water (70-80 degrees F.) or exposure to cold air (about 40 degrees F.), either in a refrigerated room or in a plastic bag surrounding the patient.

The categories of nervous system deficit that were studied included: vision, disorders of gaze and extraocular movement, movement, swallowing, phonation and articulation, spastic resistance to passive movement and deep tendon jerks. In general, all symptoms and signs were improved nearly simultaneously in variable but often marked degree after adequate reduction in body temperature. Both facilitated (passive stretch) and unfacilitated willed movement markedly improved. Coincident with the return of willed movement was the return of position and motion sensation in the extremity, but only at the joints in which movement was restored. There was a correspondingly rapid and pronounced exacerbation of the symptomatology on rewarming. Essentially the same effects occurred with each subsequent cooling.

The mechanism for this improved function is not clear. There is no evidence that acute lowering of body temperature alters the incidence or severity of the true exacerbations of the disease. Further study is planned to determine whether repeated cooling may have some effect upon the course of the disease. It is felt that the lowering of body temperature may be used as a therapeutic measure for temporary, partial relief of disabilities and discomfort resulting from the lesions of multiple sclerosis.

Outbreak of Paralysis in Morocco Due to Ortho-cresyl Phosphate Poisoning

Honor V. Smith and J. M. K. Spalding (Department of Neurology, United Oxford Hospitals), LANCET, LOND., 2:1019-1021, Dec. 5, 1959

Between Aug. 31, 1959, and Oct. 2, 1959, an outbreak of 2,000 cases of a paralyzing disease of unknown origin was reported in Morocco. This outbreak centered in Meknes and vicinity with the number of cases varying from district to district. Of these there were no Europeans, Jews, or prosperous Moslems, and few cases among the poorest of the poor Moslems. Both sexes were affected, with the highest incidence in adult women, then adult men and older children, respectively. Of approximately a quarter of a million people who come to Meknes for a feast celebration at this time, none became ill. There was no outbreak among the soldiers or prisoners.

A clinical picture of aching pain and tenderness in the calf muscles was followed by paresthesia and loss of superficial sensation in a "stocking-glove" distribution. As the disturbance of sensation decreased, motor weakness developed, first in the dorsiflexors and evertors of the foot, then the calf, and later the intrinsics of the hand. Although some severe cases showed involvement of the thighs and pelvic girdle muscles, it was noted that in most cases paralysis stopped at the knee joint. Upper extremity reflexes were commonly preserved, ankle jerks were diminished or absent. Knee jerks were exaggerated in contrast to predominantly lower motor neuron weakness. Superficial reflexes were normal with the exception of the plantar which was absent due to loss of toe movement. Ill health was uncommon, one-third had recent diarrhea, and some had transient fever and bradycardia. All routine blood and spinal fluid tests were negative. The picture was of an acute peripheral neuritis in which distribution of weakness was overwhelmingly distal.

Infection was ruled out after studying the nature of the outbreak. Poisoning of some nature was felt to be responsible for the paralysis. During investigation a dark cooking oil bearing the name of a cheap olive oil was found. The same wholesaler had supplied all afflicted areas. On chemical examination a contaminant of cresyl phosphates used to lubricate turbo jet engines was isolated. This is a highly expensive lubricant; but as the style of engines change, it becomes outdated and is then of little value. Ortho-cresyl phosphates are highly toxic to the nervous system.

The prognosis depends on the severity of the paralysis. Those with distal weakness alone recover well but take approximately one year to do so. Those with more proximal involvement take longer to recover, some remaining permanently disabled. Death may be caused from this poisoning, but no deaths have occurred in the Moroccan outbreak.

Polymyographic Studies of Voluntary and Involuntary Movements

G. Pampiglione (Hospital for Sick Children, Great Ormond Street, London), CEREBRAL PALSY BULL., 7:10-11, Autumn 1959

In assessing the severity of a motor weakness, the data obtained from clinical observation may vary from one observer to the other with regard to the same patient. Also, some variation may be expected from the same observer examining the same patient on different occasions. The method described in this paper was devised in order to record the muscle activity of a group of cerebral palsied patients suffering from a variety of motor disabilities.

Two electrodes (small silver disk electrodes) were placed on each of the following muscles: biceps, triceps, quadriceps, and hamstrings. The electrical activity of each muscle was recorded during both voluntary and involuntary movements. The appearance of muscle activity was different between normal controls and patients. Also, there was a considerable variability from one patient to the other and in the same patient from minute to minute. Some

basic patterns evolved, however, and it was possible while studying the graphs to recognize both quantitative and qualitative differences in various patients.

The author describes in detail the various findings in patients with spasticity without involuntary movements, and in patients with involuntary movements (choreo-athetosis). It appears from these preliminary observations that a record of the electrical activity of various groups of muscles might be of value as a permanent record of the motor disability in patients with so-called "cerebral palsy."

Management of Chronic Lumbosacral Strain

R. A. Bremner, and Marjory Simpson (Department of Orthopaedic Surgery, The Middlesex Hospital, London, W. 1), LANCET, LOND., 2:949-950, Nov. 28, 1959

In 1958 a report was written by Bremner on the management of patients with lumbosacral strain by manipulation under general anesthesia. The present article reports on 150 of the same type of patients treated by physical therapy without formal manipulation under anesthesia. The results of these two forms of treatment for patients with lumbosacral strain are compared.

Physical therapy was given three times weekly in the form of deep massage to the lumbosacral region, localizing any tender spots. If much spasm was present, short wave diathermy was included in the treatment. The spine was then manipulated in rotation, after the method suggested by Wiles (1956), and exercises were given to mobilize the spine and increase muscle power. The patient was instructed to continue the exercises on his own after the completion of formal treatment. Instruction on the management of the back in everyday life was considered most important.

The results of the treatment by the two methods was found to be remarkably similar. After 4 weeks in the group treated by physical therapy 55 per cent were cured, 32 per cent had improved, and 13 per cent were unchanged or worse. Physical therapy was more demanding on time, facilities, and personnel. On the other hand, patients were spared the slight risk and possible discomfort of a general anesthetic necessary to the treatment by manipulation alone.

On its face value the evidence suggests that the method of choice must depend upon the facilities of the department and in particular on the physiotherapeutic services available. The patient's ability to "live with his back" seems to be more important than the form of treatment selected.

Hypertonus and the Gamma Motoneurones

P. B. C. Matthews (Department of Physiology, University of Oxford, England), CEREBRAL PALSY BULL., 7:2-3, Autumn 1959

New research has shown that the motor apparatus is more complex than was once supposed. The author of this paper has been active in research on the role of the gamma motoneurons in hypertonus.

Hypertonus is produced by an excessive discharge of the motoneurons supplying the spastic muscles—the alpha motoneurons supplying the main muscle fibers, and the gamma motoneurons supplying the specialized muscle fibers within the muscle spindles. The activity of the gamma motoneurons does not directly produce tension in the muscle but increases the proprioceptive discharge of the muscle spindles, and this may cause contraction of the muscle by reflex excitation of the alpha motoneurons. The gamma motoneurons might, therefore, be an important factor in the development of hypertonus (reviewed by Granit 1955).

Matthews and Rushworth (in 1957) investigated the role of the gamma motoneurons in the hypertonus of decerebrate cats by selectively paralyzing their nerve fibers with procaine. The paralysis of the gamma fibers causes the stretch reflex to become smaller or to disappear, even though the remaining fibers of the stretch reflex pathway are still intact. Matthews (in 1958) also studied hypertonus in the decerebrate cat by plotting the tension reflexly developed in the muscle against the extension applied to it. From these studies he found that the activity of the gamma motoneurons affects the "threshold" rather than the "stiffness" of the hypertonus.

It may be concluded that the level of activity of the gamma motoneuron is important in determining the degree of hypertonus, and that overactivity of the gamma motoneurons is a major cause in the development of the hypertonus. It is stated, however, that hyperactivity of the gamma motoneurons is not the sole cause of hypertonus (Granit 1955).

Electromyographic Analysis of the Function of the Muscles Acting on the Ankle during Weight-Bearing with Special Reference to the Triceps Surae

S. J. Houtz and Frank P. Walsh (Detroit Orthopaedic Clinic, Detroit, Michigan), J. BONE SURG., 41-A: 1469-1481, December 1959

In an attempt to make objective evaluations of patients with muscle imbalance in the leg and foot, it became evident that there was a lack of understanding of the function during weight bearing of the normal muscles which act on the ankle. Clinical observations have shown (1) that a function of the gastrocnemius is to prevent hyperextension of the knee, (2) that the gastrocnemius and soleus are important muscles in maintaining upright posture and in raising the heel from the ground, (3) that the triceps surae are in a position to counteract the direct pull on the calcaneous by the intrinsic muscles and taut plantar fascia and the indirect pull of all the sling muscles supporting the arch and fore part of the foot, and (4) greater tension stress is sustained by the muscles, ligaments, and tendons on the medial surface of the ankle and knee joint than by those on the lateral side during standing.

The purpose of this study is to present EMG evidence concerning the function of the normal muscles acting on the ankle during weight bearing, with emphasis on the function of the triceps surae, and to attempt to correlate these findings with clinical observations. EMG studies were made on 10 normal young adults. Action potentials were picked up with surface electrodes from the following muscles—tibialis anterior, extensor digitorum longus, tibialis posterior, medial and lateral heads of gastrocnemius, soleus, peroneus longus, peroneus brevis, and flexor digitorum longus. Observations were made with the subject in a supine position, moving his foot and ankle through the range of movement, performing isometric contractions against resistance in dorsiflexion, plantar flexion, inversion, eversion, and circumduction. In the erect position the activities performed were—relaxed standing, standing on an inclined and on a declined plane, shifting the body weight from the fore part of the foot to the heel, standing on one extremity, standing on the toes of both feet and on the fore part of one foot, relaxed walking, and stair

climbing. Electromyograms of many of the activities performed are illustrated in the paper.

The evidence presented supports the following conclusions—

1. In the erect posture the gastrocnemius acts on the knee to maintain a slight degree of flexion. The medial head is more active than the lateral.

2. The soleus, in conjunction with the tibialis posterior and peroneous brevis, adjusts the position of the tibia on the tarsus and secondarily contributes to the femorotibial relationship at the knee.

3. At the ankle the act of standing up is controlled primarily by strong contraction of the tibialis anterior and extensor digitorum longus. These muscles stabilize the tibia on the tarsus as a person rises to an erect posture.

4. The magnitude of the action potentials of the leg muscles is the same, whether the subject stands on a level surface or on a plane inclined or declined to 20 degrees. The postural alinement of the body is automatically adjusted to keep its center of gravity over the center of the supporting base.

5. In the gait pattern, the gastrocnemius and soleus muscles stabilize the knee and ankle during the stance phase while the nonweight-bearing extremity is in the swing phase.

The Case Against Vasodilator Drugs in Occlusive Vascular Disease of the Legs

J. A. Gillespie (St. George's Hospital, London, S. W. 1) LANCET, LOND., 2:995-997, Dec. 5, 1959

To relieve rest-pain, ischemic skin lesions and claudication in obliterative vascular disease, vasodilator drugs should increase blood flow to the foot and calf.

A study was conducted to determine the effect of these drugs on blood flow to the foot and their value in increasing the effect of sympathectomy. The vasodilator drugs used were tolazoline, phenoxybenzamine, chlorpromazine and promazine.

Although blood-flow measurements showed that these drugs were effective in increasing the flow of blood to the feet in healthy limbs, similar studies gave little support to the use of vasodilator drugs in the treatment of the ischemic foot in occlusive arterial disease. In occlusive vascular disease when blood is redistributed due to the vasodilitation in many areas, that destined for the diseased limb can pass elsewhere more easily, and so blood flow beyond the obstruction may actually be decreased. The fall of blood flow which often follows the administration of vasodilator drugs could prove disastrous to the critically nourished foot after an acute occlusion.

The studies do not support the use of these drugs in the treatment of patients with intermittent claudication since they do not increase calf-muscle flow and often decrease it. Vasolidators usually decrease blood flow in a sympathectomised limb and therefore do not increase the effect of a sympathectomy. The drugs give no indication of the probable effect of a sympathectomy.

These clinical conclusions show that much unnecessary prescribing and expense would be saved if the effects of vasodilator drugs in occlusive vascular disease were recognized.

Acute Torticollis in Pediatric Practice

H. W. Korngold (1217 - 30th Street, Sacramento, California), A.M.A., J. DIS. CHILD., 98:756-764, January 1960

The author describes torticollis, or wry neck, as a condition in which the patient's head is tilted to one side in such a manner that the chin tends to point toward one shoulder and the occiput toward the opposite shoulder. It is stated that acute torticollis in pediatric cases has received little attention in the literature as compared with the many papers concerned with congenital torticollis.

Various forms of acute torticollis are described including: postural, ocular, allergic, muscle injury, those secondary to otitis media or subluxation of the cervical vertebrae, and those seen in suppurative cervical adenitis. A study of 46 cases is presented. No cause could be determined for the acute wry neck in 15 of these cases. The author questions that subluxation of cervical vertebrae is a common cause of torticollis. Signs and symptoms are listed as severe pain which is often associated with cervical muscle spasm and palpable evidence of a tense sternocleidomastoid muscle on one side. Rotation of the head away from the contracted side usually promotes an exacerbation of pain with limitation of motion, sometimes not beyond the mid-line. Spasm of the sternocleidomastoid muscle bilaterally is rare.

Conservative treatment consisted of medication to relieve pain, either codeine or tranquilizers, aspirin, and local heat to the neck. Cervical traction according to this author is indicated only when conservative measures fail or when there are neurological or orthopedic indications for this type of therapy.

Observations on Adult Hemiplegia and Suggestions for Treatment—Part I

Berta Bobath (The Western Cerebral Palsy Centre, London, England), PHYSIOTHERAPY, 45:279-289, December 1959

The common factors interfering with normal motor performance in adult hemiplegia include four basic types of disturbance. Sensory disturbances, in particular a deficit of position sense, two point discrimination, and accurate localization of light touch, are of primary importance since sensory information is known to be the foundation of purposeful motor output. Spasticity develops gradually to some degree in all hemiplegic patients and, in some, is joined by the appearance of tonic neck and labyrinthine reflexes, and associated reactions.

Certain muscles were described by Beevor as being associated with others in normal coordination. This association in the hemiplegic, reinforced by postural reflexes, is seen as stereotyped postures and patterns of spasticity in which the antagonists to the spastic groups are inhibited and blocked from voluntary function. Disorders of the normal postural reflex mechanism result in varying degrees of loss of righting reactions, equilibrium reactions, and adaptive changes of muscle tone as protection against the forces of gravity. As a result, the patient may, for example, be unable to relate body segments in changes of position, such as turning over; will compensate by exaggerated function of the sound side for lost equilibrium control on the affected side; and will find it far easier to hold with a muscle in the shortened range of an antigravity motion than to initiate concentric motion from the lengthened range. Loss of selective movement patterns due to inability to inhibit part of an associated pattern of movement produces stereotyped patterns of motion similar, in some respects, to those seen in the very young infant.

Principles of treatment are based on an understanding of the patient's problem, not as a lack of muscle power, but as an inability to direct nervous impulses to the desired muscle in a varied and changing combination of patterns. Abnormal stereotyped patterns and postures must be suppressed and sensory experience and practice of the new patterns provided. Reflex inhibiting postures, the partial or complete opposite of the spastic pattern, are initially produced passively by the therapist, and gradually controlled by the patient. As spasticity disappears in these new positions, active motion may be initiated and experienced by the patient. Technics of treatment during the initial flaccid stage aim to prevent development of spastic patterns. Positions are chosen, and passive or guided active motions performed which reverse these patterns. For example, excessive plantar flexion is controlled by slight flexion of the knee with a small pillow being used rather than a foot board which, with developing spasticity, would only accentuate the total extensor pattern. The patient is encouraged to lie on the affected side with the arm held in extension and external rotation while the shoulder girdle is mobilized. (There were detailed descriptions of many other suggested procedures. The article was concluded in the January journal.)

A Questionnaire Survey of Juvenile to Young-Adult Amputees Who Have Had Prostheses Supplied Them through the University of Illinois Division of Services for Crippled Children

Claude N. Lambert and Joan Sciora (University of Illinois College of Medicine, Chicago), J. BONE SURG., 41-A:1437-1454, December 1959

The purpose of this survey was to obtain information which would be helpful in evaluating various services to juvenile and young-adult amputees. The questionnaire was sent out in April, 1955, to the parents of juvenile amputees who had been fitted with prostheses by the University of Illinois Division of Services for Crippled Children between July 13, 1945, and March 9, 1955. A copy of the questionnaire is included in this article.

The results of the survey are evaluated under the following headings: statistical study (types and causes of amputations), age distribution, surgical procedures, attitudes of parents, prosthetic fitting and adjustment, training, follow-up, and social acceptance.

The authors summarize the most interesting findings as follows:

1. Greater stress should be placed on prevention, since the largest number of amputations was on a traumatic basis.

2. The need for further study of growth patterns was definitely indicated to improve surgical treatment.

3. After-care of the stump is important. This study revealed the need to stress and to review instructions in stump hygiene with the patient and parents.

4. It was brought out that more investigation is needed as to the age when a child should be fitted with a prosthesis and the age when training should begin. All agree that when a child with a lower extremity amputation is ready to walk, he is ready for a prosthesis. As for the upper extremity amputee, recommendations for fitting with a prosthesis depend on the child's development rather than his age. Further investigation of the influence of the hand which is dominant seemed to be indicated.

5. Children with lower extremity amputations and those with traumatic amputations below the elbow wore their prostheses whether or not they had had training. Training was very important, however, for adjustment to the prosthesis of the child with amputations above the elbow.

6. The child's evaluation of himself, his parents' evaluation, and the attitude of the whole population were important factors in his rehabilitation.

7. The study also revealed the need for greater dissemination of the available information to the many disciplines concerned with the rehabilitation of the child amputee.

The Pleural and Pulmonary Complications of Rheumatoid Arthritis

A. R. Horler and Malcolm Thompson (Royal Victoria Infirmary, Newcastle upon Tyne, England), ANN. INT. M., 51:1179-1199, December 1959

One hundred and eighty patients with rheumatoid arthritis seen during a two year period were investigated for possible pleural and pulmonary lesions. Nine were found to have or to have had a pleural effusion for which no cause could be found other than rheumatoid disease. Eight of these were males. Case histories are presented.

The nine patients with pleural effusion have been under observation for an average of 48 months and no evidence has developed of any other disease process that could have been responsible for the effusion. The importance of excluding other connective tissue disorders, tuberculosis, and malignant disease is discussed.

Two of these patients (both males) also had coincident parenchymatous lung lesions; in one they were nodular and in the other diffuse and fibrotic. In both, the pleural and pulmonary lesions developed some time after the onset of the arthritis.

The other 6 male patients with pleural effusion had no evident lesions of the underlying lung. In all, the appearance of the effusion was accompanied by an acute febrile respiratory illness related to the onset of the arthritis. A review of the literature confirmed the view that pleural effusion complicating rheumatoid arthritis occurs predominantly in men.

It is suggested that rheumatoid arthritis merits a place in the differential diagnosis of pleural effusion especially when this occurs in middle aged men and is associated with recent or developing joint symptoms.

Physical Medicine in Management of Patients with Postmastectomy Lymphedema

G. Keith Stillwell (Section of Physical Medicine and Rehabilitation, Mayo Clinic and Mayo Foundation, Rochester, Minnesota), J. AM. M. ASS. 171:2285-2291, Dec. 26, 1959

The literature on postmastectomy lymphedema describes three separate syndromes: an acute transient postoperative edema; an acute painful edema, also transient, appearing in the first three or four postoperative weeks; and the third, a persistent, usually painless edema, appearing weeks or months postoperatively. Treatment for the latter is described. It occurs to some degree in 50 per cent of mastectomy patients and is a significant complication in 10 to 15 per cent.

No single cause exists. Venous and lymphatic blockage due to ablation of deep axillary lymphatics, axillary scarring, venous angulation and spasm, and high susceptibility to infection due to poor lymphatic

circulation are all possible factors.

The nonsurgical treatment program used at the Mayo Clinic has as its objective the promotion of venous and lymphatic return and control of hydrostatic pressures while subcutaneous tissue and skin are adapting to the increased pressure produced by impairment of venous and lymphatic function.

Treatment is begun twice daily in the Physical Medicine Department with 30 minutes of centripetal mechanical massage using a "vasopneumatic" device; followed by 7 to 10 minutes of manual massage, isometric pumping exercises, and spiral wrapping with two elastic bandages, 3 inches in width, sewn end to end extending from the dorsum of the hand to the level of deltoid insertion.

Elevation, isometric exercise, and bandaging are then taught for independent home use. The arm is elevated on pillows and unbandaged at night. The bandage is applied before arising and removed every 2 hours during the day for half-hour periods of exercise. Exercises are performed lying supine with the arm in elevation. If, after two weeks, swelling is reduced, the interval between exercises is gradually increased. Later the bandage may be removed for increasing periods before bedtime. Heat is generally contraindicated; and the need for intensive treatment is stressed.

Two hundred and twenty patients were studied, and showed improvement of varying degrees. Some patients were never able to be free entirely of elastic support, but satisfactory improvement was made by most.

Adductor Muscle Injuries in Bowlers

James R. Hoon (The Sheboygan Clinic, Sheboygan, Wisconsin), J. AM. M. ASS., 171:2087-2089, Dec. 12, 1959

Bowling injuries have usually been limited to fingers pinched in the ball rack and occasional toes bruised by dropped bowling balls. This article describes another type of injury which can be related to the peculiar mechanics of bowling. This injury involves strain and in one case actual avulsion of the muscles of adduction of the thigh. Stress on these structures occurs during braking at the foul line on delivery of a bowling ball. Four cases are described illustrating varying degrees of injury.

Adduction of the thigh is produced by several muscles, including the lower fibers of gluteus maximus and gracilis. The primary muscles of adduction, however, are the three adductor muscles, longus, magnus, and brevis, and the pectineus. When the lower extremity is fixed, these muscles, taking their fixed points from the leg, act on the pelvis to help maintain the body in an erect position and to prevent forward displacement of the body on an extended leg, as in the cases presented.

It is suggested that these injuries may be prevented by sound physical conditioning, by altering the approach to the foul line, and by "following through" rather than braking violently.

Abstracters for April

The Editorial Board is indebted to the following Association members for the carefully prepared abstracts in this issue.

Rachel Adams — Betty Lambertson
Ethel Coeling — Geraldine Midgley
Dorothy Kemske — Nancy Watts
Miriam Partridge

Book Reviews . . . . .

Strong and Elwyn's Human Neuroanatomy. *By Raymond C. Truex, Professor of Anatomy, Hahnemann Medical College, Philadelphia. Ed. 4. Cloth; price $10.00. Pp. 511; illus. Williams & Wilkins, Baltimore, 1959.*

Strong and Elwyn's neuroanatomy text was originally prepared to give the student and the physician a thorough and clear presentation of the structural and functional mechanisms of the human nervous system with some understanding of their clinical significance. Professor Elwyn's strongest objective was to keep his volume a "student textbook."

Since the printing of the third edition there has been a flood of excellent scientific investigations contributing much new information to neuroanatomy from the fields of neurohistology, neurophysiology, neurosurgery and others, but time would not permit the inclusion of all of these excellent papers or data in this presentation. Much of this information is related to the internal structures and functions of the nerve cell. Even though the author states that he has not the time for "even a brief appraisal of this literature," he has utilized his background well in presenting clearly and completely the structure of the neuron in Chapter VI.

One of the outstanding features of this text is the free use of illustrations. There are 23 new ones in this edition; many of them are in color which helps to distinguish the nerve tracts in particular. The visual continuity is excellent in these illustrations, making total comprehension much easier.

There are 21 chapters in this book: starting with the Origin and Composition of the Nervous System, the Development of the Nervous System, The Meninges of the Central Nervous System, Gross Considerations of the Central Nervous System, and Blood Supply of the Central Nervous System. From this chapter on, the detailed anatomy of the nervous system is covered in a sequence common to most texts on the subject of neuroanatomy.

Chapters IV and V are new. Chapter IV, Gross Considerations of the Central Nervous System, is a welcome innovation since a student can form clear concepts of internal microscopic structure if he possesses a thorough knowledge of macroscopic surface appearance. The large size of the illustration on the various sections of the brain helps the reader to relax and enjoy learning that which often is considered tedious material to grasp. The labeling of the illustrations is done in large distinct type, each label being freely separated from the next, thus allowing ease in reading. In Chapter V there are 19 large, colored, and clearly labeled diagrams in the total of 20 pages. This is some indication of the use of visual learning which is so much stressed in the composition of this volume.

The major changes were made in Chapters I and III. The diagrammatic presentation of six different primitive organisms showing developmental comparisons of the nervous systems is an unusual section to find and a most helpful one. The comparison of sensory neuron structures in different animals is most enlightening. Probably the most noticeable change in Chapter III is the arrangement of the material in a more simplified and yet complete order. The diagrams presented are helpful and crystal clear. In Chapter XIII there

is an interesting section at the end which correlates the nerve fiber pathways with clinical lesions of the tracts.

There are 17 pages of bibliography —subdivided as follows: 1) comprehensive texts and atlases and 2) general and special references including those quoted in the text. In the latter subdivision, references are offered which cover the areas mentioned as being too exhaustive to include in this volume.

This is an excellent text and reference book, up-to-date and clearly presented. It will ably serve anyone who is interested in learning or reviewing the essentials of neuroanatomy.

Preventive Medicine: Principles of Prevention in the Occurrence and Progression of Disease. *Edited by Herman E. Hilleboe, M.D., Commissioner of Health, State of New York, Department of Health, Albany; and Granville W. Larimore, M.D., Deputy Commissioner of Health, State of New York, Department of Health, Albany. Cloth; price $12.00. Pp. 731; illus. W. B. Saunders, Philadelphia, 1959.*

Thirty-one leaders in public health have contributed their findings to the content of this textbook which has an abundance of information about the nation's and world's health. It is well organized and illustrated. It contains many statistical charts and diagrams. The text of 702 pages portrays in three parts the concept of modern preventive medicine, i.e., "Prevention of Occurrence" (of disease); "Prevention of Progression" (of disease); "Supporting Services for Preventive Medicine." Preventive medicine is a dynamic concept with the constant quality of change. Both the classical and the developing concerns of public health in the twentieth century are presented. The discussion has a wide scope and includes "ionizing radiation, medical defense against atomic attack or natural disaster, accident hazards, hygiene of housing, rickettsial diseases, provision of suitable and sufficient nutrition, obesity, screening methods for cancer and heart disease, rehabilitation, alcoholism, health education, patient education and communication, the role of the hospital in preventive medicine, and epidemiological methods and inferences" (in preventive medicine).

The underlying thesis of this 1959 textbook is the need for the private physician to support the work of the physician who is a specialist in public health, and conversely, in order for the medical needs of the patient to be satisfactorily met in our changing world. "First, private practitioners and public health physicians need to understand the separate concerns of each, if both are to accomplish the common mission of eliminating disease and suffering. Both are supported in this pursuit by a common pool of medical knowledge, to which each contributes and from which each draws in equal measure."

The physical therapist is cited as a significant professional person in the modern rehabilitation concept and also as a member of the local health department staff. Quoted as examples of the important contribution physical therapy makes in the armamentarium of modern medicine are physical therapy services in the acute care of people with poliomyelitis, cerebral vascular accident, and follow-up maintenance therapy at home following hospital or rehabilitation center care.

This is a fascinating discussion of current preventive medicine which would interest a physical therapist anticipating assignment in a foreign country, a practicing physical therapist in a hospital, rehabilitation center, public health agency, school or private office, or even an inactive physical therapist who wants to be informed.

Physiology of Exercise. *By Laurence E. Morehouse, Ph.D., F.A.C.S.M., Professor of Physical Education, University of California at Los Angeles and Augustus T. Miller, Jr., Ph.D., M.D., Professor of Physiology, University of North Carolina Medical School. Ed. 3, Cloth; price $4.75. Pp. 349; illus. C. V. Mosby Co., St. Louis, 1959.*

The third edition of Morehouse and Miller's well known textbook has been considerably revised to bring the text up to date in view of the amount of research that is going on in the field of muscle physiology. The book remains what it has always been, a very excellent introductory textbook to physiology of exercise. About one third of the book deals with the physiology of muscle contraction and excitation and basic physiology of movement. The remaining part deals with the importance of circulation and respiration in the physiology of exercise and the biochemical aspects of muscle contraction. It is interesting to note that only scant attention is paid in this book to the muscle spindle system. Actually this is probably quite justified. While there is a large volume of data on the so-called "gamma system," the actual application of these data to the physiology of exercise is still poorly understood. Therefore it possibly does not belong in a textbook dealing with fundamentals. On the other hand one cannot avoid the feeling that the knowledge of the muscle spindle system is going to be of such importance to an understanding of the physiology of exercise that at least the basic description of this important physiologic concept might have found a place in this textbook.

The inclusion of an elaborate discussion of the heart and circulatory system and its relation to exercise is a significant advantage of this textbook. While it is generally understood that heart and circulation undergo changes as a result of exercise it is not always sufficiently appreciated how, particularly in an older person, the circulatory system can be more important in determining the over-all exercise program than the muscles. In older patients with diseases of the central nervous system who also have diseases of the circulation this becomes a very important point, and while this book does not deal with the medical aspects of exercise except in one short chapter, it is important that as a basic textbook heart and circulation have been given adequate space. Psychological and stress factors have been adequately discussed. This book could well be used as an introductory textbook in a course on physiology of exercise for physical therapists provided it is realized that the neurophysiology of exercise including the physiology of coordination and the mechanisms of central nervous system control of muscle should be elaborated well beyond the contents of this book.

Anatomy and Physiology, Vol. 2. *By Edwin B. Steen, Ph.D., and Ashley Montagu, Ph.D. Paper; price $2.50. Pp. 314; illus. Barnes & Noble, New York, 1959.*

As the authors state in their preface, this is merely an outline to be used to supplement other texts, or as a refresher for those who have studied anatomy and physiology. Some of the advantages are a listing of references to standard textbooks, with mention of various diseases and disorders at the close of each chapter,

as well as special terms regarding the particular system covered.

Each system covered in the text is discussed anatomically and physiologically and the histology of the cell structures in each system is reviewed. One of the disadvantages is that the discussion of physiologic functions, in many of the chapters, beside being brief appears to be cut short. The outline is an excellent refresher for those with an adequate background in the subject.

The Effects of Advancing Age Upon the Human Spinal Cord. *By Raymond L. Morrison, M.D.; formerly Associate in Neuropathology at the Massachusetts General Hospital and Instructor at Harvard Medical School. Following his death in 1950, work was completed by Stanley Cobb, M.D., and Walter Bauer, M.D., both of the Harvard Medical School. Cloth; price $6.00. Pp. 127; illus. Harvard University Press, Cambridge, Massachusetts, 1959.*

This is a distinctly superior atlas that clearly and accurately describes and illustrates the structures at all levels of the normal spinal cord with the variations that occur in each decade of life up to the ninth.

The book should be of almost indispensable value as a reference for those who wish to study the diseases of the spinal cord or are involved in the not uncommon problem as to whether or not a given section of the spinal cord is within normal limits. The reviewer has no knowledge of a comparable book that is available for reference and special study.

Vocational Rehabilitation for the Physically Handicapped. *By Louise M. Neuschutz. Forewords by Winthrop M. Phelps, M.D., Medical Director, Children's Rehabilitation Institute for Cerebral Palsy, Baltimore; Consultant in Cerebral Palsy for New York, New Jersey, Delaware, Maryland, Pennsylvania, and other states; and K. Vernon Banta, Technical Adviser to the President's Committee on Employment of Physically Handicapped. Cloth; price $5.75. Pp. 136. Charles C Thomas, Springfield, Illinois, 1959.*

This small manual represents an important collection of information concerning evaluation of workers' physical capacities as well as examination of job requirements. It is divided into three parts. The first deals with types of physical handicaps; the second, facilities and agencies to assist in dealing with such handicaps, and the third is a discussion of education and training of the severely handicapped person who is homebound.

Not only are basic factors concerning handicaps discussed, but a fine outline of points to be considered in planning rehabilitation is included. In addition, there is a bibliography of suggested reading in each chapter. This book should serve as a useful reference book for years to come. Its value is especially important to those who are seeking information concerning the availability of products and facilities and agencies to handle specific problems of the physically handicapped. It is obvious that this book will be of value to all who are dealing with the various facets of rehabilitation.

The Handicapped: A Challenge to the Nonhandicapped. *By Adolph A. Apton, F.I.C.S. Plastic Surgeon, member of staff of Mt. Sinai Hospital, New York. Formerly, Assistant Surgeon at University Hospital in Berlin and Cologne, Germany. Cloth; price $3.00. Pp. 134. Citadel Press, New York, 1959.*

This is essentially an others-have-done-it-you-can-do-it type of book, i.e., it is more challenge met than challenge thrown out. It combines the homeliness of an Edgar Guest and the hopefulness of a Norman Vincent Peale. And yet, this is not enough, for the book lectures rather than teaches, interests rather than stimulates, and substitutes generalizations (too often platitudinous) for guiding principles. Mayhap were I a handicapped person I might respond differently, but I don't think so. I have the feeling that what Dr. Apton has written is what he says to patients and their parents, relatives, and friends. The personal touch would make it effective. But what is said in sincere and earnest helpfulness loses vigor and communication in the printed page.

The one basic and constructive contribution emerging from this little book relates to courses recommended for those who specialize in teaching handicapped children: English, psychology, philosophy, and rehabilitation.

The reviews published here do not necessarily represent the opinions of the American Physical Therapy Association.

Book Reviewers for April

H. D. Bouman, M.D., Professor of Physical Medicine, University of Wisconsin, Madison; Editor of *American Journal of Physical Medicine.*

Carolyn Bowen, Physical Therapy Consultant, Washington State Department of Health, Seattle.

Wilton Marion Krogman, Ph.D., Professor of Physical Anthropology, Graduate School of Medicine, University of Pennsylvania, Philadelphia.

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New items which may be of interest to physical therapists will be mentioned in these pages each month. The accompanying explanations are made by the manufacturers and have not been investigated by the *Physical Therapy Review*.

40. Lumbosacral Support

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41. Lightweight Cane

A new cane featuring a slightly resilient grip which fits the normal angle of the user's hand is now available. The thumb and index finger grip this newly designed handle easily allowing the entire hand to rest on the grip in relaxed comfort, even when the user's weight is on the cane.

The cane's shaft is constructed of lightweight, anodized aluminum alloy secured in "one piece" fashion to the handle. This eliminates joint problems usually encountered in normal T-cane construction and enables the manufacturer to guarantee it against splitting or breaking. It is finished in black and ornamented with a smart chrome ring. Three sizes are available. Fascole Corp.

(continued on next page)

42. Home Whirlpool Bath

The "Aqua-Spa" deluxe home whirlpool bath is portable and designed for use in ordinary bathtubs. All electrical and major "driving" mechanisms remain outside the tub with a nonelectrical "agitator head" creating the necessary turbulence and flow in the water. Suction cups hold the position of the agitator head for "focusing" on the part of the body to be treated.

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Positions Available

TWO PHYSICAL THERAPISTS: Prefer one have previous experience in clinical affiliation, for general rehabilitation services, children and adult, in- and outpatients. Community nonprofit rehabilitation hospital located in fast-growing and progressive area—medical center setting—with good opportunity for advancement and liberal personnel policies. Write to Robert L. Gossett, Director of Rehabilitation, Charlotte Rehabilitation Hospital, 1610 Brunswick Avenue, Charlotte, North Carolina.

WANTED IMMEDIATELY: STAFF physical therapist —male or female. Must have training and experience in working with C.P. and orthopedically handicapped children. Work in a Crippled Children's Treatment Center in Anchorage. Four weeks summer vacation with two weeks for Xmas. Contact: Nick Peters, R.P.T., Supervisor, Alaska State Elks Cerebral Palsy Program, 1020 I Street, Anchorage, Alaska.

PHYSICAL THERAPIST: For orthopaedic surgeon in private practice, with all types of patients. New department being established in new orthopaedic office building built especially for the purpose. Fully equipped. Excellent living conditions, climate, and recreational facilities. This town is Medical Center for 300,000 people. Salary open, depending on experience. D. M. Kingsley, M.D., 530 Desoto Street, Alexandria, La.

PHYSICAL THERAPIST—Chief therapist for modern, 110-bed general hospital. Therapist aide trained by present Chief Therapist available to assist. Affiliation with Board Physiatrist. Starting salary $4,600 to $5,200 with excellent fringe benefits. Three major ski areas within 5 to 20 miles of hospital. Summer recreational activities excellent; 125 miles from Boston, Mass. Apply to Administrator, Springfield Hospital, Springfield, Vermont.

PHYSICAL THERAPIST: 571-bed general hospital in suburban area; newly-equipped department has 4 registered therapists and 3 aides. In- and outpatients for Orthopedic, Neurology, Internal Medicine, Neuro-surgery and rehabilitation work. Good salary range with increments; excellent fringe benefits. Write The Reading Hospital, Personnel Dept., West Reading, Pa.

PHYSICAL THERAPISTS: Salary range $385-$440. Vacations, sick leave, holidays, insurance, professional laundry and other benefits. New 120-bed Rehabilitation Center offering complete services to rehab patients and patients from the Acute Adult and Childrens wings of main hospital. Work under the direction of two Physiatrists. May advance from staff to area supervisory positions. Inquire Personnel Department, Iowa Methodist Hospital, Des Moines, Iowa.

Municipal hospital of 704 beds needs two Registered PHYSICAL THERAPISTS (Male-Female) for expanded outpatient and inpatient program with wide variety of cases. Liberal personnel policies, 40-hour week, 2 weeks vacation, sick leave, etc. Salary $4888 to $5863 within 4 years. Write to R. E. White, Personnel Office, Hurley Hospital, Flint 2, Michigan.

EASTER SEAL SOCIETY needs physical therapist for case load of 100 children and adults. Salary is open, depending on qualifications and experience. For further information write: William R. Rees, Exec. Dir., 223 No. Maple Ave., Greensburg, Pa.

WANTED: Qualified physical therapist for work in a busy orthopedic office. Salary dependent upon experience. Vacation with pay. Holidays. Write: Frank A. Serena, M.D., 75 South Main Street, South Norwalk, Conn.

Positions Available

ORTHOPEDIC CLINIC with two surgeons needs a qualified physical therapist (female preferred). Salary dependent upon experience. Drs. Lebold and Anderson, 1489 State Street, Salem, Oregon.

PHYSICAL THERAPIST for in- and outpatient clinics of expanding general hospital with medical and physical therapy curricula; $4,040 with annual increments; 5-day week, vacation and sick leave. Contact Miss R. M. Latimer, Department of Physical Therapy, School of Medicine, 520 R. West Lombard St., University of Maryland, Baltimore 1, Md.

QUALIFIED PHYSICAL THERAPIST for immediate placement on staff of modern, well equipped, expanding department of 300-bed general hospital. Located in progressive university city of 40,000. Excellent opportunity for professional advancement. Contact: Mr. James E. Roetto, Chief Physical Therapist, Jackson-Madison County General Hospital, Jackson, Tennessee.

PHYSICAL THERAPIST, female, for expanding department in 800-bed general hospital. Salary open—adjusted in accordance with experience. Good personnel policies, paid vacation, sick leave, Blue Cross-Blue Shield, free Pension Plan, 40-hour week. Fine Medical supervision. Write or call John R. Mote, Administrative Assistant, Methodist Hospital, 1604 N. Capitol Ave., Indianapolis, Ind.

SALARY to exceed $6500.00 for therapist "capable of opening and managing" New Physical Therapy Department located in hospital's New Addition. Good housing, cultural and professional opportunity available; 30 miles from Loop. Write Administrator, St. James Hospital, Chicago Heights, Illinois.

PHYSICAL THERAPIST: Orthopedic Clinic staffed by three orthopedic surgeons, in one of Chicago's beautiful North Shore suburbs. Interested only in top notch, experienced individual. Salary open. Ravinia Orthopedic Clinic, 695 Roger Williams Ave., Highland Park, Illinois.

PHYSICAL THERAPIST—Male or female. Salary open. Good personnel policies. Hospital fully approved. Apply: Robert M. Murphy, Administrator, Floyd Hospital, Rome, Georgia.

WANTED IMMEDIATELY: One qualified field staff physical therapist for home-bound service in a generalized voluntary public health nursing agency to work under qualified physical therapy supervision. Current salary range $4104-$4968 with increase expected June 1: 37½-hr., 5-day wk; 8 holidays; 22 working days vacation; 15 working days sick leave. Apply Supervisor, Physical Therapy Department, Visiting Nurse Society of Philadelphia, 1340 Lombard Street, Philadelphia 47, Pennsylvania.

RPT's, male or female, for Physical Medicine and Rehab. Dept., Tampa General Hospital, $4400-$5500. Vacancy for Chief PT, $4944-$6327. Reply Rehabilitation Coordinator, Tampa 6, Florida.

QUALIFIED PHYSICAL THERAPIST (two) for outpatient cerebral palsy treatment center. Starting salary $4550 per year. Two months vacation, liberal sick leave benefits. Liberal personnel policy. Contact Robert Schlitt, Director, Peninsula Cerebral Palsy Training Center, 901-24th Street, Newport News, Virginia.

REGISTERED PHYSICAL THERAPIST for 180-bed hospital in Omaha, Nebraska. Five-day, 40-hr. week. Sick leave, paid vacation, other employee benefits. Salary commensurate with qualifications. Apply to Roger Rosseter, Personnel Director, Immanuel Hospital, 36 and Meredith, Omaha 11, Nebraska.

High starting salary with credit for experience; rapid advancement; overtime pay; life and hospital insurance; sick leave; 3 weeks paid vacation. Pleasant working conditions in private hospital setting associated with 3 full-time physiatrists. Graduate physical therapists interested in progressive restorative medicine should contact Director of Research and Education, Institute of Physical Medicine and Rehabilitation, 619 N. E. Glen Oak Avenue, Peoria, Illinois.

Wanted PROGRESSIVE DIRECTOR and two qualified STAFF THERAPISTS to develop well equipped physical therapy department. Liberal personnel policies. Salary commensurate with experience. Contact Glenn C. Williams, Administrator, Mary Free Bed Guild Children's Hospital & Orthopedic Center, 920 Cherry St., Grand Rapids 6, Michigan.

(continued on next page)

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PHYSICAL THERAPIST for 400-bed general hospital in Metropolitan-Washington, D.C. area. Annual sick leave benefits. Hospitalization insurance, annual increments, 40-hr, 5 day wk. Variety of conditions on in- and outpatient basis. Salary commensurate with experience. New graduate accepted. Inquire Personnel Dept. Prince George's Gen. Hosp., Cheverly, Maryland, Tel. No. SPruce 3-3300.

PHYSICAL THERAPIST: Male or Female for 700-bed general hospital with complete PMR Dept. Good salary, increment and merit raises. Forty-hr. week; 3 weeks vacation; sick leave benefits. Write: Herman J. Bearzy, M.D., Miami Valley Hospital, Dayton 9, Ohio.

PHYSICAL THERAPISTS: Immediate openings 1956-bed N.P. Hospital, 38 miles north of New York City. Starting salary $4980 per annum; liberal sick leave and vacation benefits, with a fine retirement system. Contact: Chief, Personnel Division, VA Hospital, Montrose, N. Y.

GRADUATES OF APPROVED SCHOOLS FOR PHYSICAL THERAPISTS, *new legislation provides that you may now practice under professional supervision in this State pending registration with the California Board of Medical Examiners.* Positions open in State Hospitals, the Veterans Home and special schools for handicapped children. Starting salaries $436.00 and up; liberal employee benefits; promotional opportunities. Streamlined civil service examinations twice a month in San Francisco and Los Angeles, and on request in other states near candidate's residence. Write State Personnel Board, 801 Capitol Avenue, P.T. 71, Sacramento 14, California.

REGISTERED physical therapist for 265-bed general hospital affiliated with college of medicine. Forty hr.-week, 2 weeks paid vacation, and sick leave. Good salary and merit increases. Write Robert C. Terrill, Assistant Administrator, Mary Fletcher Hospital, Burlington, Vt.

STAFF PHYSICAL THERAPIST: To help service 490-bed hospital. Cross-section of medical and surgical disabilities treated. Congenial working conditions. Liberal salary and fringe benefits. Five-day, 40-hour week. Apply Personnel Department, The Grace Hospital, 4160 John R., Detroit 1, Michigan.

REGISTERED PHYSICAL THERAPIST for staff position in 210-bed hospital. Liberal vacation, retirement and insurance plan. Quarters, if desired. Salary open. Wide variety of treatment. Write Morley Wilson, Sunshine Hospital, 750 Fuller N.E., Grand Rapids, Michigan.

STAFF PHYSICAL THERAPIST: Well established department handling adult cases in a 604-bed general private nonprofit hospital. Department under orthopedic staff supervision. Salary open; 40-hour week; noon meal and laundry furnished; two weeks' paid vacation and sick leave; Blue Cross and Blue Shield plan available. Write Phillip B. Donley, Chief P.T., Akron City Hospital, Akron, Ohio.

WANTED: Registered physical therapist for 70-bed Children's Orthopedic Hospital. Present registered therapist on maternity leave will return on part time basis only. Department also has well trained aide. Salary commensurate with experience and ability. Excellent opportunity for advancement. Fringe benefits include hospitalization insurance, retirement plan, meal while on duty, laundry of uniforms. Room and board at nominal cost available in lovely Nurses Cottage. Mrs. Helen P. Haese, Superintendent, Scottish Rite Hospital, 2201 Welborn, Dallas 19, Texas.

STAFF PHYSICAL THERAPISTS—opportunity to work in expanding rehabilitation department in 518-bed general hospital under the direction of Physiatrist; wide variety of cases; 5-day week; good starting salary with regular increments and liberal fringe benefits. Apply Personnel Department, St. Joseph's Hospital, Paterson, New Jersey.

STAFF PHYSICAL THERAPIST for service to homebound patients. Staff of five therapists and coordinator. Nursing staff of 65. Salary range $5400-$6756; 40-hr., 5 day wk.; 7 holidays; 15 days vacation increasing to 21 days in 3 years; 12 days sick leave; 8¢ mile business mileage. Write Cynthia A. Dauch, Exec. Dir., Visiting Nurse Association of Los Angeles, 2530 West 8th St., Los Angeles 57, Calif.

PHYSICAL THERAPIST: Experienced. Wanted for active, well equipped department in a 154-bed hospital with expansion program under way. Pleasant surroundings in north suburb of Chicago. Modern housing. Recreational facilities and cultural activities available. Good salary, 40-hour week, varied cases treated. Contact Personnel Director, Highland Park Hospital, Highland Park, Illinois.

OPPORTUNITIES for staff physical therapists in 500-bed teaching hospital. Department treats a wide variety of cases—both inpatients and outpatients. Pleasant University community located in foothills of the Blue Ridge mountains. Good working conditions and liberal benefits. Contact: Personnel Office, University of Virginia, 1416 West Main Street, Charlottesville, Virginia.

PHYSICAL THERAPIST

For new modern air-conditioned Physical Medicine & Rehabilitation Department under direction of full-time Physiatrist; 300-bed general hospital. Large gymnasium. Latest equipment. Wide variety of treatment program. Salary open. Write Dr. Edward P. Reese, Director, Department of Physical Medicine & Rehabilitation, Lutheran Hospital, 2609 Franklin Boulevard, Cleveland 13, Ohio.

Positions Available

PHYSICAL THERAPIST for outpatient Rehabilitation Center directed by physiatrist. Wide variety of treatment program. Coordinated physical, occupational, speech-hearing, psychological, vocational and social services. Excellent personnel policies and working conditions. Contact R. A. Silvanik, Administrator, The Rehabilitation Center of Summit County, Inc., 326 Locust Street Akron 2, Ohio.

WANTED: second physical therapist for 200-bed general hospital, semiclosed staff. Physicians referring patients all board certified or eligible. Salary open, liberal personnel policies, good housing available, expenses paid applicants invited for personnel interview. Contact: Wayne B. Foster, Adm., Holzer Hospital and Clinic, First Avenue & Cedar Sts., Gallipolis, Ohio.

QUALIFIED PHYSICAL THERAPIST for staff position in a 440-bed hospital. Department soon to be enlarged. Wide variety of cases divided between hospital and outpatient. Forty-hour week, paid vacation, sick leave and holidays; salary open depending upon qualifications and experience. Excellent opportunity in a growing community located in the Valley of the Sun, winter capital of the Southwest. Apply Personnel Director, Good Samaritan Hospital, Phoenix, Arizona.

STAFF PHYSICAL THERAPIST: Female: 250-bed general, accredited hospital, 10 miles West of Boston. Prefer experienced; eligible for or already registered. Salary based on experience, 5-day, Monday-Friday, 40-hour week. Vacation, sick leave, pension plan, plus other liberal personnel policies. Apply Personnel Office Newton-Wellesley Hospital, 2014 Washington St., Newton Lower Falls, Massachusetts.

PHYSICAL THERAPIST, female, wanted to treat outpatients of two orthopedic surgeons in newly equipped section of their office. Position available in June. Salary open. Write to: Drs. Davis and Hopkins, 309 Mayer Bldg., Portland 5, Oregon.

REGISTERED PHYSICAL THERAPIST—Positions open for Head R.P.T. and Staff R.P.T. in well established department. Excellent working conditions, 40-hour week, liberal vacation and sick leave policies. Salaries open. Apply E. G. Derrick, The Orthopedic Clinic, 2620 North 3d Street, Phoenix, Arizona.

WANTED: Qualified physical therapist (female) to complete staff of three in Physical Therapy Dept. Private orthopaedic clinic. Five orthopaedists. New, modern clinic building. Generous and attractive physical therapy space. Salary dependent on experience—experience not essential. Two wks. vacation, sick leave, social security benefits, group insurance participation, professional liability insurance furnished. Apply: Mr. Lewis W. Sykes, Business Manager, The Miller Clinic, 1822 Brunswick Avenue, Charlotte, North Carolina.

PHYSICAL THERAPIST to fill vacancy in $1,250,000 expansion, APTA; AMA approved graduate. Complete diversity of treatments; 50% of census is children. Excellent wage and vacation plan. Contact Mr. R. Ward, Administrator, Sunnyview Orthopedic & Rehabilitation Center, 124 Rosa Road, Schenectady, New York.

PHYSICAL THERAPIST for expanding cerebral palsy outpatient clinic. Minimum salary $4420.00 with annual increments. Thirty-five hour week. Excellent personnel policies. Call or write C. Fred Bartens, United Cerebral Palsy, 601 N. Hayne St., Pensacola, "Home of the Blue Angels," Florida.

STAFF PHYSICAL THERAPIST for 400-bed private general hospital with large active volume outpatient department. Liberal salary range and employee benefits. May be experienced or recent graduate—licensed in Wisconsin or eligible to take license examination. Excellent working conditions in one of midwest's foremost institutions. Centrally located in city and convenient to outstanding residential and shopping facilities. Contact Personnel Director, Milwaukee Hospital, 2200 W. Kilbourn Ave., Milwaukee 3, Wisconsin.

OPENING Staff Physical Therapist, expanding Physical Therapy Department. Modern, air-conditioned 235-bed hospital, located, deep south. Wide variety of treatment cases. Department under medical supervision of two Orthopedic surgeons. Excellent chance for advancement. Prefer two years experience, starting salary $500 month. Generous fringe benefits, vacation with pay. Contact Supervisor Physical Therapy Department, Providence Hospital, P. O. Box 4067, Mobile, Alabama.

SOUTHERN NEW ENGLAND—STAFF POSITIONS. Registered physical therapists for expanding physical medicine department under full time personal direction of qualified doctor of physical medicine. Opportunity to participate in development of modern, progressive rehabilitation program in 680-bed voluntary general hospital serving metropolitan area. Modern personnel practices and salary scale. Write Personnel Department, Rhode Island Hospital, Providence 3, R. I.

PHYSICAL THERAPIST

Immediate opening in 340-bed general hospital located in Upstate Medical Center. Female required. Experience not essential. Well established department, newly modernized. Liberal personnel policies, scheduled salary reviews. Contact Personnel Director, Syracuse Memorial Hospital, 736 Irving Avenue, Syracuse 10, New York.

Large, progressive, teaching institution in Cleveland, Ohio offers a challenging staff position with 5 day, 40 hour week, exceptional benefits, modern facilities, and competitive salary. Address replies to Box 23 care of the Physical Therapy Review, 1790 Broadway, New York 19, N. Y.

REGISTERED physical therapist, modern GERIATRIC setting, attractive salary plus fringe benefits. House available adjoining premises. Contact Mr. Martin S. Freeman, Hebrew Home for Aged, Inc., 615 Tower Avenue, Hartford, Connecticut. Telephone CHapel 2-6207.

QUALIFIED PHYSICAL THERAPIST (male or female) for well equipped physical therapy department. Five-day, 40-hours a week, paid vacation and sick leave. Write: Mr. L. D. Harris, Physical Therapy Director, Cook County Hospital, 1825 West Harrison Street, Chicago 12, Illinois.

Positions Available

OPENING for STAFF PHYSICAL THERAPIST in rapidly growing Rehabilitation Center directed by Physiatrist. Wide variety of treatment program. Coordinated physical, occupational, speech-hearing, psychological, vocational and social services. Salaries are commensurate with experience. Liberal vacations and sick leave benefits, lunch and laundry provided. For complete information contact Executive Director, Harmarville Rehabilitation Center, Pittsburgh 38, Pa.

PHYSICAL THERAPIST with at least one year experience to join staff of growing rehabilitation center. Patients include various types of handicaps. Excellent supervision and working situation, with Orthopedic Surgeons and other medical specialties. Beginning salary, $4,200 to $4,800 per annum. Contact Robert L. West, R.P.T., Easter Seal Therapy Center, Tallahassee, Florida.

WANTED IMMEDIATELY: Two (2) qualified staff physical therapists. Salary commensurate with experience. Inquire: Louis M. Tinghino, Director, Physical Therapy, Kessler Institute, Pleasant Valley Way, West Orange, New Jersey.

WORK IN SOUTHERN CALIFORNIA: Physical Therapists needed to staff Rehabilitation Service at Rancho Los Amigos Hospital. All aspects of rehabilitation of all age levels including post-acute and convalescent care of respirator patients, general medical, and orthopedic disabilities and all aspects of bracing and prosthetics. In-service training program under direction of physical therapy instructor. Five-day, 40-hour week, holidays, sick leave, vacation privileges, retirement benefits with Civil Service rights. New building and most modern equipment available. Quarters available, laundry furnished. Good beginning salary, annual increases. Write: Personnel Director, Rancho Los Amigos Hospital, Downey, California.

PHYSICAL THERAPISTS

Supervisory and staff openings. California registered or eligible. New Rehabilitation Center. Personnel Director, Cedars of Lebanon Hospital, 4833 Fountain Ave., Hollywood 29, California.

PHYSICAL THERAPIST to run a mobile unit to travel in Fauquier, Laudoun and Clark Counties, northern Va., to give therapy to home patients for the Arthritis and Rheumatism Foundation. Must be willing to live in Warrenton or nearby. Salary $4400 to $4800 per annum depending on experience. Contact Mrs. F. E. Mars, The Plains, Va.

STAFF PHYSICAL THERAPISTS (2 each), immediately, GM&S hospital, 40 hr. week, 8 holidays, 13 working days vacation, 13 days sick leave, group insurance, retirement benefits; starting salary, $4040 new graduate, $4980 with 6 mos. experience. University city. Contact Chief P.T., VA Hospital, Durham, N. C.

PHYSICAL THERAPIST for Staff position in Arlington County (Va.) Department of Public Health's modern crippled children's program. Male or female. Salary range: $4,580-$5,560. U.S. Citizenship required. Attractive employee benefits. Apply Arlington County Personnel Department, Court House, Arlington Virginia.

QUALIFIED PHYSICAL THERAPIST. 71-bed general hospital with excellent growth potential. Salary commensurate with ability. Five-day week, four weeks paid vacation, twelve days sick leave annually, and seven paid holidays. Write stating references and salary desired to: Personnel Director, Kerbs Memorial Hospital, St. Albans, Vermont.

PHYSICAL THERAPY COORDINATOR. Technical consultation and supervision for five physical therapists; consultation for nursing staff of 65. Service to homebound patients. Female. Salary range $6360-$7980; 40 hr., 5 day wk; 7 holidays; 15 days vacation increasing to 21 days in 3 years; 12 days sick leave; 8¢ mile business mileage. Write Cynthia A. Dauch, Exec. Dir., Visiting Nurse Association of Los Angeles, 2530 West 8th St., Los Angeles 57, Calif.

PHYSICAL THERAPISTS

Positions in two of ten general hospitals located in eastern Kentucky, Southwestern Virginia, and southern West Virginia, operating on a regional pattern. Three Central and seven Community hospitals. Board certified Physiatrist in each Central hospital supervises physical therapist within region. Active ambulatory patient clinics, progressive minded medical staff, modern equipment. Two years minimum experience. Salary at $5,880 per annum; 40-hour week, 4 weeks paid vacation, 7 paid holidays, annual increments.

Write to: Miners Memorial Hospital Association
Box #61, Williamson, West Virginia

GROWING 5-man clinic wants to expand physical therapy department in new building being built for 8 physicians. Pioneering work has been done by part-time man for past 2 years and volume warrants full-time therapist. No other department in town. Minimum starting salary of $4,800.00 plus fringe benefits. Apply to Harold E. Freese, Business Manager, Kearney Clinic, Kearney, Nebraska.

STAFF PHYSICAL THERAPIST, female preferred, for general outpatient program. Salary range from $3850-$4800. Beginning date, June 15. Five day week, liberal vacation and sick leave. Social Security. Apply: Mrs. C. D. Cochrane, Assistant Director, Junior Service League Orthopedic Center, 1219 Dunn Avenue, Daytona Beach, Florida.

REGISTERED Physical Therapist, female, for newly expanded Department in 350-bed general hospital, under direction of a qualified physiatrist. Good personnel policies, paid vacation, sick leave, Blue-Cross—Blue Shield, Social Security, 40-hour week. Apply Personnel Department, Sinai Hospital, 6767 W. Outer Drive, Detroit 35, Michigan.

SENIOR THERAPIST AND STAFF PHYSICAL THERAPIST for expanding and progressive rehabilitation program in Baltimore and Hagerstown, Maryland. Salary: Senior $5,040.00, Staff $4,540.00 with annual increments, vacation and sick leave. New and well-equipped clinics, forty-hour, five-day week, inpatients only. Apply Dr. Florence Mahoney, Director Rehabilitation Medicine, or Miss Dorothea Barthel, Supervising Physical Therapist, Montebello Hospital, 2201 Argonne Drive, Baltimore 18, Maryland.

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The four large ball-bearing casters have step-on brakes, which provide important advantages. By applying the brakes on two casters, the movement of the walker is slowed down. By applying all four brakes the walker can be positively locked in place—an important safety feature in many cases, such as if the therapist should have to leave a patient unattended.

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PARALLEL LOCKS for Casters, another unique feature, prevent lateral motion. On Ambul-Aid each swivel caster has a parallel lock, which can be set to prevent the caster swiveling. Locking either the two front or two rear wheels gives the patient better control of the direction of the walker.

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